AUDIO VISUAL COMMUNICATION REVIEW

Raymond E. Denno — Classroom Screen Darkness Levels for Educational Film Projection

William A. Belson — Selective Perception in Viewing a Television Broadcast

John Moldstad — Doctoral Dissertations in Audio-Visual Education: Supplement I

Departments:

- Film
- Current Developments in Communication
- Book Reviews
- Research Abstracts

WINTER 1958

VOL. 6
NO. 1

AUDIO-VISUAL COMMUNICATION REVIEW

WILLIAM H. ALLEN, EDITOR
System Development Corporation,
Santa Monica, Calif.

KENNETH NORBERG,
DEPARTMENTAL EDITOR
Sacramento State College

MARY C. HEDQUIST, Managing Editor
Department of Audio-Visual Instruction

Editorial Board

Anna L. Hyer
Dept. of Audio-Visual Instruction

Amo De Bernardis
Portland (Ore.) Public Schools

James D. Finn
University of Southern California

Charles F. Hoban
University of Pennsylvania

L. C. Larson
Indiana University

Wesley C. Meierhenry
University of Nebraska

Robert deKieffer, University of Colorado

Editorial Consultants

Edward G. Bernard
New York City Public Schools

Wolfgang Brudny
Wissenschaftliches Institut fuer
Jugendfilmfragen
Munich, Germany

W. R. Fulton
University of Oklahoma

James J. Gibson
Cornell University

S. I. Hayakawa
San Francisco State College

Alexander H. Howard, Jr.
Central Washington College
of Education

Joseph H. Kanner
Audio-Visual Applications Office,
Army Pictorial Service
Washington, D. C.

Robert LeFranc
Ministère de l'Education Nationale
Paris, France

Arthur A. Lumsdaine
Air Force Personnel and
Training Research Center

Henry R. McCarty
Texas Technological College

Mrs. Lillian McNulty
Louisville Public Schools

John Moldstad
Indiana University

Gordon A. Sabine
Michigan State University

E. G. Sherburne, Jr.
University of California
Berkeley

Harry J. Skornia
National Association of
Educational Broadcasters

Mrs. Grace Stevenson
American Library Association

Mrs. Altha Sullivan
Indiana State Department of
Public Instruction

Loran C. Twyford
Michigan State University

A. W. VanderMeer
The Pennsylvania State University

Robert W. Wagner
Ohio State University

Copyright 1958 by
Department of Audio-Visual Instruction, National Education Association

Library of Congress Catalog Card Number: 56-4703

AUDIO VISUAL
COMMUNICATION REVIEW

VOLUME VI, NUMBER 1 WINTER 1958

CONTENTS

Articles

- CLASSROOM SCREEN DARKNESS LEVELS FOR EDUCATIONAL FILM PROJECTION 5
  RAYMOND E. DENNO
- SELECTIVE PERCEPTION IN VIEWING A TELEVISION BROADCAST 23
  WILLIAM A. BELSON
- DOCTORAL DISSERTATIONS IN AUDIO-VISUAL EDUCATION: SUPPLEMENT I 33
  JOHN MOLDSTAD

Film

- THE INTERNATIONAL EDUCATIONAL FILM 49
  ROBERT W. WAGNER

Current Developments in Communication

- VISUAL METHODS IN THE SOVIET UNION 56
  DAVID JOHNSTON

Book Reviews

- RUESCH, JURGEN AND KEES, WELDON
  Nonverbal Communication 67
  Reviewed by Franklin Fearing

• BROWN, JAMES W. AND LEWIS, RICHARD B., editors
AV Instructional Materials Manual 71
Reviewed by Herbert Hite

Research Abstracts

TELEVISION

• *An Inventory of Instructional Television Research* 73
HIDEYA KUMATA

• *Teaching by Discussion on Television* 73
H. CLAY HARSHBARGER AND SAM L. BECKER

• *Teaching Typewriting Through Television* 74
WILLIAM R. PASEWARK

• *An Experimental Study of the Acquisition of Information from Three Types of Recorded Television Presentations* 74
JOHN HOLWAY ULRICH

• *Teaching Algebra and Physics by Means of Television* 75
KENNETH W. LUND AND OTHERS

• *A Study of Teaching by Television Under Two Conditions* 75
W. C. MEIERHENRY

• *A Study of the Effectiveness of Television as a Medium of Instruction in High School Chemistry 1955-1956* 76
CINCINNATI PUBLIC SCHOOLS

• *Two-Way Educational Closed Circuit Television* 76
JOHN R. MARTIN

• *A Brief Report and Evaluation of Closed-Circuit Television Instruction in Mechanical Engineering 360* 77
W. F. SEIBERT

• *Closed Circuit Television Instruction* 77
PURDUE UNIVERSITY

TRAINING AIDS

• *An Evaluation of the Trainer-Tester and Punchboard Tutor as Electronic Trouble-Shooting Training Aids* 78
JOAN H. CANTOR AND JUDSON S. BROWN

• *A Method of Training Aids Selection* 79
MYRON WOOLMAN

• *Study of the Present Status of Training Aids and Devices in the Army Transportation Company Officers Course* 79
JOHN A. SCOPINO AND OTHERS

MODELS

• *Three-Dimensional Teaching Aids for Trade and Industrial Instruction* 80
OFFICE OF EDUCATION

The Audio-Visual COMMUNICATION REVIEW is issued quarterly. Subscription $4.00 per year. Special rate to members of DAVI $3.00. Single copy $1.25. Entered as second class matter in Washington, D. C.

Original manuscripts, books for review, and editorial communications should be sent to the Editor: WILLIAM H. ALLEN, System Development Corporation, 2500 Colorado Avenue, Santa Monica, California. (Mark envelope "Personal.")

Subscriptions and business communications should be sent to: MARY C. HEDQUIST, Managing Editor, Department of Audio-Visual Instruction, National Education Association, 1201 16th Street, N. W., Washington 6, D. C.

CLASSROOM SCREEN DARKNESS LEVELS FOR EDUCATIONAL FILM PROJECTION

● RAYMOND E. DENNO

This paper reports the results of a study designed to gather evidence on the variability in opacity of educational films and to determine the minimum room darkness levels needed for acceptable classroom film projection. It is based on a doctoral dissertation completed at the University of California, Los Angeles, in 1957. Raymond E. Denno is director of Audio-Visual Service, San Diego County Schools, California.

IN THE construction of public school classrooms, school boards, administrators, and architects are concerned with size, shape, heating, acoustics, ventilation, storage work areas, fixtures, and many other factors—but often give little or no attention to the control of classroom light levels necessary for adequate projection. By including complete classroom light control in the original plans, the difficult, extensive, and even impossible darkening situations can be avoided.

Among the reasons for giving light control low priority in the planning and building of public school classrooms are (a) the various degrees of importance given to audio-visual projection materials, and (b) the lack of convincing evidence relative to the darkness levels necessary for adequate classroom projection. This study was directed toward the gathering of further evidence on the classroom darkness levels necessary for projection of educationally acceptable 16mm motion picture film images.

The problem for this study focused attention on two major questions: First, what is the opacity variability in black-and-white and in color educational motion picture films? Second, what are the screen ambient light ranges within which educationally acceptable projected film images can be produced in public school classrooms?

OPACITY VARIABILITY

Lists of the 100 most used 16mm black-and-white films from each of five major California public school audio-visual libraries were combined and ranked according to the frequency of their appearance on the five lists. The identical procedure was utilized in preparing the list of 100 color films. Ten films were randomly selected from the black-and-white film list, and 10 from the color film list.

The instrument shown in Figure I—employing a light source, a film footage counter, and a light meter—was devised for meas-

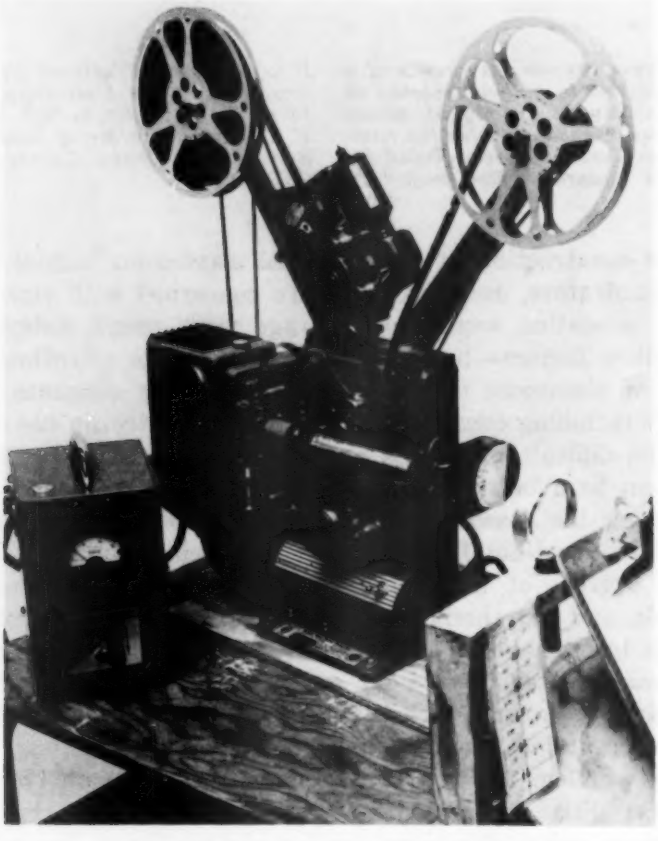


Figure I

Instrument for Measuring Film Frame Opacity

uring film opacity. Several controls were used to maintain a constant light source. Measurements were taken at two-foot intervals for each of the 20 films. Relative opacity arithmetical means were established for each 100 feet of each film. In addition, a total film mean was computed for each of the 10 black-and-white films and 10 color films. These data are reported in Tables 1 and 2.

TABLE 1—RELATIVE OPACITY MEASUREMENTS FOR 10 BLACK-AND-WHITE FILMS

** Film	* OPACITY MEAN PER 100 FEET											* Film Opacity Mean
	0–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	
1	6.42	7.49	8.0	.73	.69	.76	1.78	.88	2.08	4.63	2.54	2.82
2	5.89	3.74	4.01	4.61	4.56							4.58
3	7.42	5.92	6.87	8.69	9.90	7.69	6.55					7.46
4	7.05	6.58	8.55	7.90								7.48
5	10.04	10.26	8.84	7.01								9.39
6	6.77	11.93	13.86	7.32	11.91	12.84	3.26	7.95				9.72
7	9.98	8.23	21.91	3.64								11.19
8	12.28	13.27	13.6	7.39								12.07
9	14.01	14.93	12.04	14.79	13.64	12.61	12.91					13.19
10	16.36	19.30	18.07	14.20								16.42

* Measured in foot-candles
** Arranged in rank order of film relative opacities

Wide variation was found in the relative opacity of both black-and-white and color films. The black-and-white film means ranged from 2.82 foot-candles to 16.42 foot-candles, with color films ranging from 5.34 foot-candles to 28.65 foot-candles.

TABLE 2—RELATIVE OPACITY MEASUREMENTS FOR 10 COLOR FILMS

** Film	* OPACITY MEAN PER 100 FEET									* Opacity Mean
	0–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	
1	5.58	4.91	5.81	4.86						5.34
2	3.58	6.52	5.88	7.28	8.89	2.68				6.20
3	8.49	8.76	10.96	7.66	6.12	6.21	5.74	1.74	5.67	6.82
4	9.02	6.25	7.75	6.42	7.69	7.09	7.36	6.45		7.25
5	7.54	6.65	7.69	8.95	7.28					7.50
6	8.05	7.95	7.20	7.30						7.63
7	12.44	2.79	15.49							9.77
8	9.20	12.72	9.89	7.85						9.91
9	18.26	21.99	15.02	16.24						19.33
10	39.37	45.7	39.8	24.86	14.11	18.90	12.05			28.65

* Measured in foot-candles
** Arranged in rank order of relative opacities

COMPARISON OF DUPLICATE PRINTS

The relative opacity means of two black-and-white duplicate prints and two color duplicate prints were compared to determine opacity variability. Findings are shown in Table 3.

TABLE 3—RELATIVE OPACITY MEASUREMENTS IN FOOT-CANDLES FOR TWO BLACK-AND-WHITE AND TWO COLOR DUPLICATE FILM PRINTS

FILM	PRINT	FOOT-CANDLE MEANS	DIFFERENCE
Black-and-White A	1	9.39	6.03
	2	3.36	
Black-and-White B	1	12.07	2.12
	2	9.95	
Color A	1	7.81	.18
	2	7.63	
Color B	1	9.91	.36
	2	9.55	

The foregoing indicates considerable variation in the opacity of duplicate black-and-white prints. Little opacity variation is indicated between duplicate color prints.

SETTING OF AMBIENT LIGHT VIEWING RANGES FOR 16mm FILMS BY TEACHER JURY

In order to approximate as closely as possible regular classroom practice, the operations, procedures, and equipment normally used in public school classrooms were adhered to in this part of the experiment.

A jury of five teachers was selected on the basis of professional interest, successful passing of a color blindness test, 15/20 vision or better, and at least two years of successful teaching experience. Maximum and minimum ambient light viewing levels for each 100 feet of the 10 selected black-and-white films and for the 10 selected color films were set by the jury. Maximum and minimum levels were defined as follows:

> *Minimum level:* When the ambient (incidental, environing) light falling on the screen has been reduced to the point where the jury, by quorum (four teachers), agrees that the image projected upon the screen has reached minimum acceptable viewing quality for educational purposes, this point is termed the minimum level and is measured in foot-candles.

TABLE 4—SUMMARY OF SCREEN AMBIENT LIGHT RANGES SET BY TEACHER JURY PER 100 FEET OF 10 BLACK-AND-WHITE MOTION PICTURE FILMS

PER 100 FOOT SCREEN AMBIENT LIGHT RANGE MEANS (IN FOOT-CANDLES)

Film No.		1	2	3	4	5	6	7	8	9	10
0–1	Mx.	8.0	18.54	10.0	12.62	10.44	10.90	10.25	8.5	12.07	14.02
	Mn.	.38	2.23	2.2	2.3	2.8	1.43	1.61	1.55	4.95	2.78
1–2	Mx.	1.46	1.2	5.98	1.3	2.4	1.8	1.63	1.62	2.5	2.95
	Mn.	7.30	7.5	9.0	12.5	7.5	10.0	10.0	8.36	12.2	16.90
2–3	Mx.	2.56	9.82	10.5	10.92	9.0	8.33	18.5	9.1	9.9	20.0
	Mn.	.248	1.33	1.9	2.93	3.7	1.27	1.8	2.5	4.29	4.53
3–4	Mx.	2.92	7.0	12.5	6.0	10.0	7.0	19.0	7.12	10.80	21.3
	Mn.	.44	1.5	4.9	2.05	3.0	1.4	.63	1.88	2.45	4.7
4–5	Mx.	2.11	10.0	23.7			6.36			10.6	
	Mn.	.81	1.10	3.2			1.27			2.7	
5–6	Mx.	2.98		14.0			4.8			11.18	
	Mn.	.21		3.2			.95			3.92	
6–7	Mx.	1.85		17.0			3.3			12.2	
	Mn.	.20		2.21			.2			3.8	
7–8	Mx.	2.2					2.4				
	Mn.	.15					1.09				
8–9	Mx.	1.72									
	Mn.	.52									
9–10	Mx.	2.4									
	Mn.	1.6									
10–	Mx.	6.28									
	Mn.	.85									
RANGE	Mx.	8.0	18.54	23.7	12.62	10.44	10.90	19.0	9.1	12.2	21.3
	Mn.	.15	1.2	1.9	1.3	2.4	.2	.63	1.55	2.45	2.95

TABLE 5—SUMMARY OF SCREEN AMBIENT LIGHT RANGES SET BY TEACHER JURY PER 100 FEET OF 10 COLOR MOTION PICTURE FILMS

PER 100 FOOT SCREEN AMBIENT LIGHT RANGE MEANS (IN FOOT-CANDLES)

Film No.		1	2	3	4	5	6	7	8	9	10
0–1	Mx.	6.02	.64	6.56	1.58	6.02	7.24	19.86	4.37	3.04	11.88
	Mn.	.62	.61	.64	.25	.99	1.12	.6	.34	.5	.68
1–2	Mx.	8.12	2.33	6.52	1.68	4.34	5.1	1.2	6.96	2.86	7.26
	Mn.	1.37	.22	.74	.25	.62	.55	.03	.33	.13	.07
2–3	Mx.	7.16	4.76	6.44	4.12	3.42	4.5	4.22	7.8	8.36	5.32
	Mn.	1.2	.23	.7	.23	.5	.5	.39	.45	.56	.7
3–4	Mx.	5.06	3.84	6.96	2.36	1.17	4.54		4.9	7.1	19.08
	Mn.	.43	.68	.73	.61	.59	.4		.49	.024	.2
4–5	Mx.		4.0	5.34	4.15	3.61					8.92
	Mn.		.74	1.38	.65	.6					.7
5–6	Mx.		5.01	4.0	1.22						5.0
	Mn.		.27	.65	.61						.65
6–7	Mx.			.24	.66						7.68
	Mn.			2.55	3.7						.9
7–8	Mx.			.7	.5						
	Mn.			1.34	3.88						
8–9	Mx.			1.0							
	Mn.			.2							
9–10	Mx.										
	Mn.										
10–	Mx.										
	Mn.										
RANGE	Mx.	8.12	5.01	6.96	4.15	6.02	7.24	19.86	7.8	8.36	19.08
	Mn.	.43	.22	.2	.23	.5	.4	.03	.33	.024	.2

Maximum level: When the ambient (incidental, environing) light falling on the screen has been reduced to the point where the jury, by quorum (four teachers), agrees that the motion picture image projected upon the screen reaches a point where further reduction of the classroom ambient light level at the screen does not materially improve the screen image, this point is termed maximum level, and is measured in foot-candles.

Under rigidly controlled conditions, the teacher jury established both minimum and maximum screen ambient light viewing levels for each 100 feet of the 10 selected black-and-white, and 10 selected color films. Findings are reported in Tables 4 and 5.

From the per 100-foot minimum and maximum ambient light viewing levels, a maximum and a minimum mean were computed for each of the 10 black-and-white films—and for each of the 10 color films—as shown in Tables 6 and 7.

TABLE 6—MAXIMUM AND MINIMUM SCREEN AMBIENT LIGHT MEANS FOR TEN BLACK-AND-WHITE FILMS

FILM	* PER 100-FOOT MEANS	
	MAXIMUM	MINIMUM
1	.62	3.66
2	1.47	10.57
3	3.37	13.81
4	2.14	10.51
5	2.97	9.24
6	1.17	6.64
7	1.41	14.44
8	1.88	8.27
9	3.51	11.28
10	3.47	18.05

* Measured in foot-candles

TABLE 7—MAXIMUM AND MINIMUM SCREEN AMBIENT LIGHT MEANS FOR 10 COLOR FILMS

FILM	* PER 100-FOOT MEANS	
	MAXIMUM	MINIMUM
1	.91	6.59
2	.46	3.43
3	.66	3.78
4	.47	2.84
5	.67	3.71
6	.64	5.34
7	.34	8.43
8	.4	6.0
9	.3	5.34
10	.56	9.3

* Measured in foot-candles

BLACK-AND-WHITE FILM OPACITY AND SCREEN AMBIENT LIGHT RANGE RELATIONSHIPS

To determine whether the relationships between film relative opacities and screen ambient light ranges set by the teacher jury were significant, the following data were correlated:

(a) Readings from the per 100-foot screen ambient light minimum viewing levels for the 10 black-and-white films shown in Table 4 were correlated with the per 100-foot relative opacity means for the same films reported in Table 1.

(b) Readings from the per 100-foot screen ambient light maximum viewing levels for the 10 black-and-white films shown in Table 4 were correlated with the per 100-foot relative opacity means for the same films reported in Table 1.

The correlation data resulting from (a) and (b) above are reported in Table 8.

TABLE 8—RELATIONSHIPS BETWEEN RELATIVE OPACITIES AND SCREEN AMBIENT LIGHT VIEWING LEVELS

FILM	* MEASURES	N	RANGE	Σ	M	S.D.	r	LEVEL OF SIGNIFICANCE
Black-and-White	Minimum Ambient Light Levels	58	1.72–23.7	554.45	9.55	5.1	.52**	1%
	Relative Opacities	58	.69–21.91	507.08	8.74	4.83		
	Maximum Ambient Light Levels	58	.15– 5.98	120.49	2.07	1.35	.58**	1%

* Per 100-foot means expressed in foot-candles
** Significant

Analysis of Relative Opacity—Screen Ambient Light Range Relationships for Black-and-White Films

With positive significant correlations existing between black-and-white film opacity and screen ambient light viewing levels, it appears that as the opacity of the film decreases (gets lighter in density) a corresponding increase results in ambient light tolerance at the screen. These relationships are visualized in Figure II.

This generalization, however, should not be considered to be on a continuum. That is, if the opacity could be decreased enough,

it would be possible to project black-and-white films in daylight. Table 8 shows the maximum light means at 2.07 foot-candles.

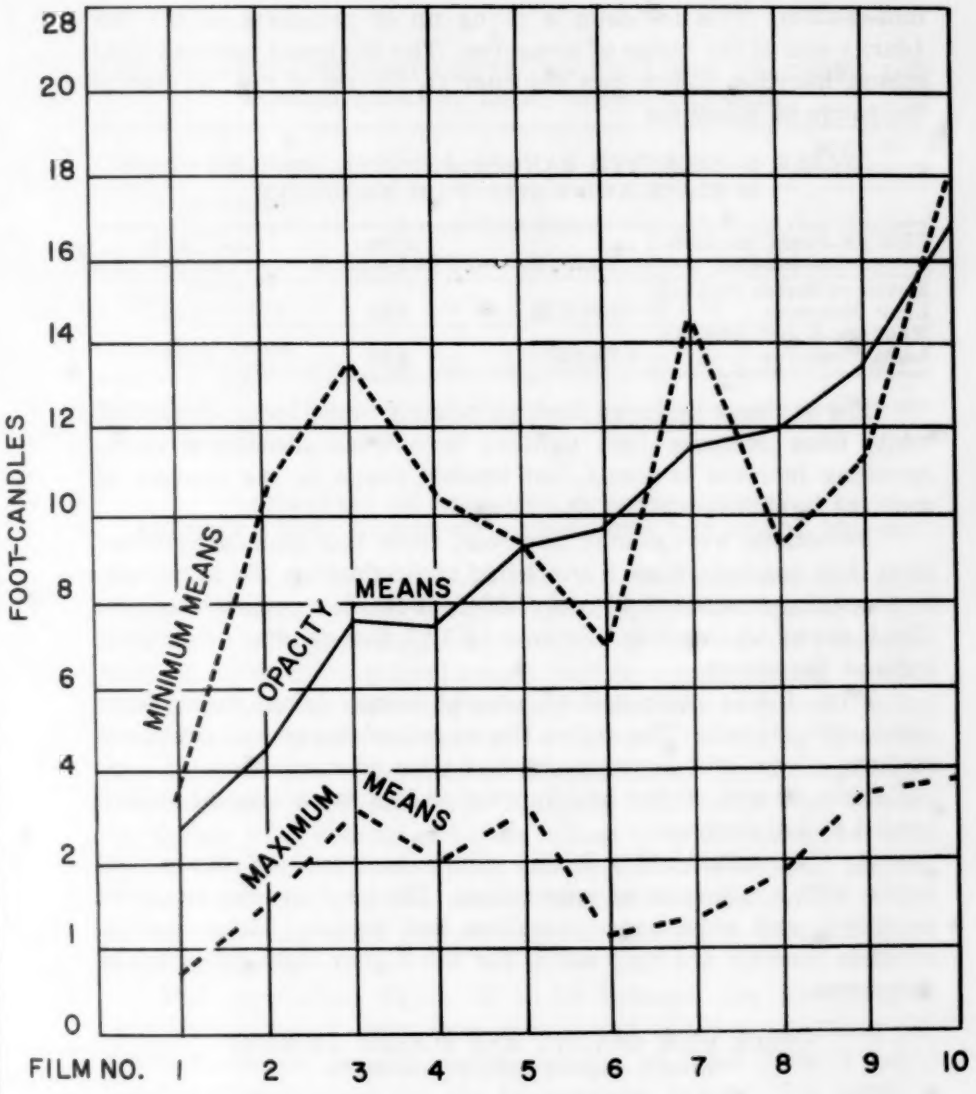


Figure II

Relationships Between Maximum Viewing (Means), Minimum Viewing (Means), and Film Relative Opacity (Means) for Ten Black-and-White Films

Furthermore, a review of Table 9, Selected Ranges and Percentiles of Ten Black-and-White Film Measures, shows the maximum screen ambient light measures ranging from .15 to 5.98 with the 25th percentile at 1.63 foot-candles and the 75th percentile at 2.86 foot-candles. This indicates a piling up of measures at the low (dark) end of the range of measures. The minimum ambient light means, likewise, follow this tendency to pile up at the low end of the range of measures.

TABLE 9—SELECTED RANGES AND PERCENTILES OF 10 BLACK-AND-WHITE FILM MEASURES

PER 100-FOOT MEANS (in foot-candles)	RANGE	25TH PERCENTILE	75TH PERCENTILE
Maximum Screen Ambient Light Measures	.15– 5.98	1.63	2.86
Minimum Screen Ambient Light Measures	1.72–23.7	6.82	12.35

The evidence indicates that, as relative opacities of black-and-white films decrease (get lighter) in over-all density, a corresponding increase is found, but limited range in the amount of ambient light tolerated at the screen.

Deviations were found, however, from this general relationship. For example, films 3 and 4 had approximately the same relative opacity means: 7.46 and 7.48 foot-candles respectively, yet film 3 shows an increase tolerance of 1.27 foot-candles of ambient light at the screen.

Film 4 was composed of several scenes taken from documentary newsreels. The entire film appeared foggy and contained sections where still photographs had been photographed. A considerable amount of the middle gray values were present, which tended to kill contrast.

By comparison, film 3 had sharp contrasts of darks and lights, with a minimum of gray values. The photographs appeared excellent, with good figure definition and details. These characteristics possibly are responsible for the higher light tolerance at the screen.

COLOR FILM OPACITY AND SCREEN AMBIENT LIGHT RANGE RELATIONSHIPS

From data reported in Tables 2 and 5, a positive correlation of .43 was found to exist between the per 100-foot *minimum* ambient light level means and corresponding per 100-foot relative

opacity means for the 10 color films. A negative correlation of —.14 was found to exist between the per 100-foot *maximum* ambient light level means and the corresponding 100-foot relative opacity means for the same films. These data are reported in Table 10.

TABLE 10—RELATIONSHIPS BETWEEN RELATIVE OPACITIES AND SCREEN AMBIENT LIGHT VIEWING LEVELS

Film	* Measures	N	Range	Σ	M	S.D.	r	Level of Significance
Color	Minimum Ambient Light Levels	54	.64–19.08	276.09	5.11	3.09	.43**	1%
	Relative Opacities	54	1.74–45.7	570.66	10.56	8.79		
	Maximum Ambient Light Levels	54	.03– 1.38	29.95	.55	.29	r–.14	1%

* Per 100-foot means expressed in foot-candles
** Significant

ANALYSIS OF RELATIVE OPACITY-SCREEN AMBIENT LIGHT RANGE RELATIONSHIPS FOR COLOR FILMS

Since a correlation of .43 between *minimum* ambient light viewing level means and the corresponding relative opacity means is at variance with the correlation of —.14 between the *maximum* ambient light viewing level means and its corresponding relative opacity means, the following subjective analysis is given. During the setting of the *minimum* screen ambient light viewing levels for color films, it was noted that, although some of the dominant picture contrasts were identifiable, the jury apparently could not see the darker color masses and color values until the screen ambient light level approached maximum viewing level. This could account in part for the positive correlation between minimum screen ambient viewing levels and corresponding relative opacity means for color films.

The correlation figure of —.14 between the per 100-foot *maximum* ambient light level means and the corresponding per 100-foot relative opacity means for the 10 color films is not a significant correlation for the 54 measures taken. This negative correlation can be interpreted to mean that, as color film relative opacity decreases (that is, gets lighter), a corresponding decrease

appears in screen ambient light tolerance. As charted in Figure III, there appears to be little deviation from this generalization.

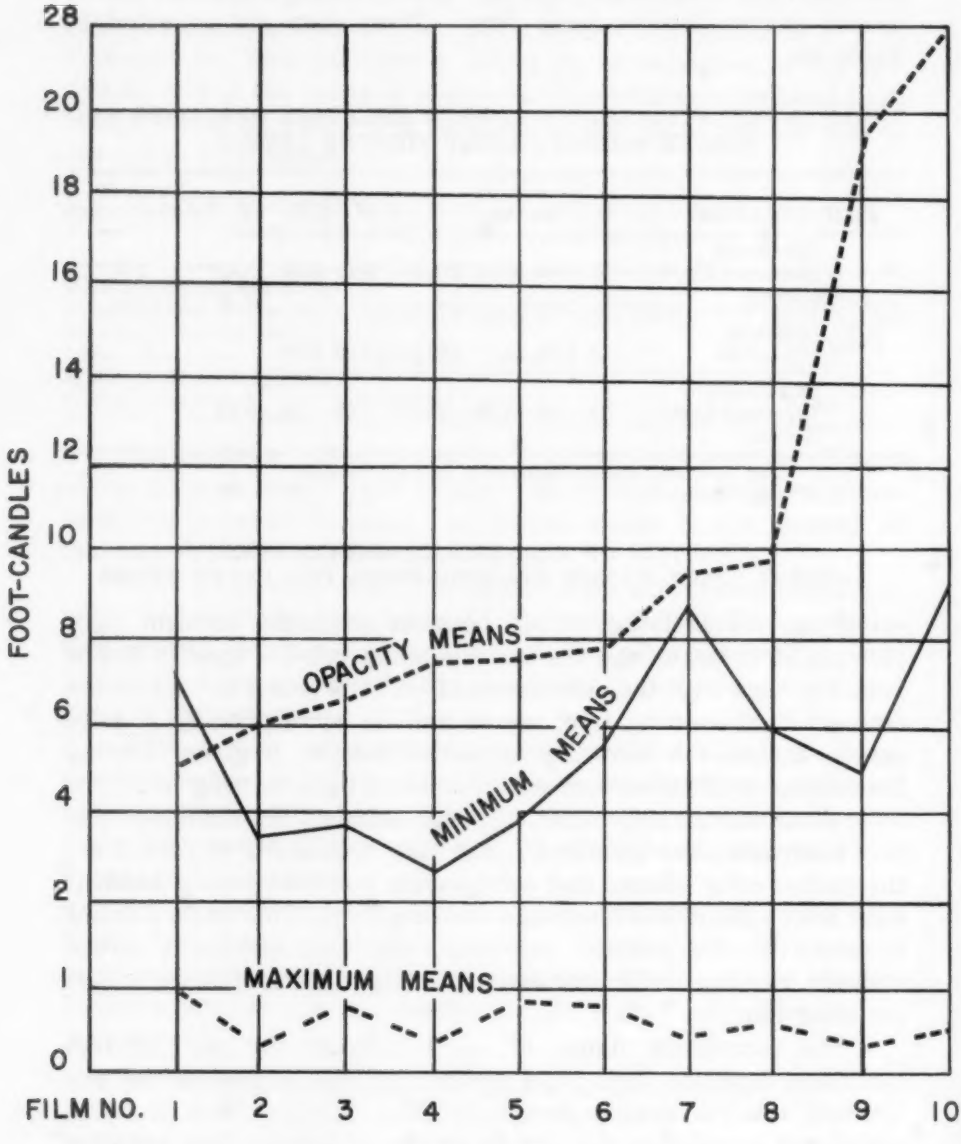


Figure III

Relationships Between the Maximum Means, Minimum Means, and Relative Opacity Means for Ten Color Films

No evidence was found to indicate that this relationship would be changed by additional measures. It can be said that within the range of the screen ambient light measures of this study, a decrease (lessening in over-all density) in color film relative opacity is accompanied by a corresponding continuous decrease (darkening) in screen ambient light tolerance for *maximum* viewing levels.

Comparison of Black-and-White and Color Film Relative Opacities

The evidence indicates a wider variation in color film relative opacity than in black-and-white films. The per 100-foot relative opacity means for black-and-white films show a range of .69-21.91 foot-candles with a standard deviation of 4.83, while the corresponding range for color film relative opacity is 1.74-45.7 with a standard deviation of 8.79 foot-candles.

SCREEN AMBIENT LIGHT RANGES

Black-and-White Film Viewing Ranges

A frequency distribution was compiled using the rank order list of the per 100-foot screen minimum ambient light level means for the 10 black-and-white films. The distribution is reported in Table 11.

TABLE 11—DISTRIBUTION OF TEACHER JURY SCREEN *MINIMUM* AMBIENT LIGHT LEVEL MEANS FOR 10 BLACK-AND-WHITE FILMS

Per Hundred-Foot Means (In Foot-Candles)	Frequency	Relative Frequency
23.5–25.5	1	.017
21.5–23.5	0	.000
19.5–21.5	2	.035
17.5–19.5	3	.051
15.5–17.5	2	.035
13.5–15.5	2	.035
11.5–13.5	6	.101
9.5–11.5	15	.258
7.5– 9.5	9	.156
5.5– 7.5	7	.120
3.5– 5.5	1	.017
1.5– 3.5	10	.172
TOTAL	58	1.000

Interpreting the data presented in the relative frequency column of Table 11, 172 of each 1000 per 100-foot minimum viewing

level means will probably fall between the 1.5–3.5 foot-candles interval.

Table 12 reports the frequency distribution for maximum ambient light level means.

TABLE 12—DISTRIBUTION OF TEACHER JURY SCREEN *MAXIMUM* AMBIENT LIGHT LEVEL MEANS FOR 10 BLACK-AND-WHITE FILMS

Per Hundred-Foot Means (In Foot-Candles)	Frequency	Relative Frequency
5.5–6	1	.017
5–5.5	0	.000
4.5–5	4	.068
4–4.5	1	.017
3.5–4	3	.051
3–3.5	3	.051
2.5–3	7	.120
2–2.5	7	.120
1.5–2	10	.172
1–1.5	10	.172
.5–1	5	.082
0– .5	7	.120
TOTAL	58	1.000

Interpreting from the relative frequency column of Table 12, 120 of each 1000 per 100-foot maximum viewing level means will probably fall between the 0–.5 foot-candle interval. With the large number of measures tending to pile up near the low end of the range of measures, a .15 foot-candle (low reading in the 0–.5 interval) screen ambient light level would have to be met to provide maximum viewing level requirements for black-and-white films. From these data, we could probably expect the curve suggested by the distribution in Table 12 to remain relatively constant if more samplings were to be added.

Color Film Viewing Ranges

A frequency distribution was compiled using a rank order list of the per 100-foot screen minimum ambient light level means for the 10 color films. This distribution is reported in Table 13.

Interpreting from the relative frequency column in Table 13, 130 of each 1000 per 100-foot minimum viewing level means will fall between the 1-2 foot-candles interval, with one falling below this measure.

TABLE 13—DISTRIBUTION OF TEACHER JURY SCREEN *MINIMUM* AMBIENT LIGHT LEVEL MEANS FOR 10 COLOR FILMS

Per Hundred-Foot Means (In Foot-Candles)	Frequency	Relative Frequency
19–20	1	.018
18–19	0	.000
17–18	0	.000
16–17	0	.000
15–16	0	.000
14–15	0	.000
13–14	0	.000
12–13	0	.000
11–12	1	.018
10–11	0	.000
9–10	1	.018
8– 9	3	.056
7– 8	6	.111
6– 7	7	.130
5– 6	6	.111
4– 5	11	.204
3– 4	6	.111
2– 3	4	.075
1– 2	7	.130
0– 1	1	.018
TOTAL	54	1.000

A frequency distribution was compiled using a rank order list of the per 100-foot maximum ambient light level means for the 10 color films. The distribution is reported in Table 14.

TABLE 14—DISTRIBUTION OF TEACHER JURY SCREEN *MAXIMUM* AMBIENT LIGHT LEVEL MEANS FOR 10 COLOR FILMS

Per Hundred-Foot Means (In Foot-Candles)	Frequency	Relative Frequency
1.35–1.45	2	.037
1.25–1.35	0	.000
1.15–1.25	1	.018
1.05–1.15	1	.018
.95–1.05	1	.018
.85– .95	1	.018
.75– .85	0	.000
.65– .75	13	.244
.55– .65	11	.203
.45– .55	6	.111
.35– .45	3	.056
.25– .35	6	.111
.15– .25	6	.111
.05– .15	2	.038
0– .05	1	.019
TOTAL	54	1.000

Interpreting from the relative frequency column in Table 14, 111 of each 1000 per 100-foot maximum viewing level means would probably fall between the .15–.25 foot-candle interval. Classroom light control facilities would have to provide a .15 foot-candle ambient light level at the screen to meet the maximum viewing level for color films.

CONCLUSIONS

Opacity Variability in Educational Motion Picture Films

1. A wide variation is found in black-and-white film relative opacity.
2. A wide variation is found in color film relative opacity.
3. Color films have greater relative opacity variation than do black-and-white films.
4. Relative opacity variation has been found between duplicate prints of the same black-and-white film.
5. Opacity differences were less marked between duplicate color prints.

Relative Opacity—Screen Ambient Light Range Relationships

1. A definite relationship exists between the minimum viewing levels and the corresponding relative opacities of black-and-white films.

2. A definite relationship exists between the maximum viewing levels and the corresponding relative opacities of black-and-white films. In general, as the relative opacities of black-and-white films decrease—that is, get lighter in over-all density—a corresponding increase is found, but limited range in the amount of ambient light tolerated at maximum viewing levels.

3. As color film relative opacity increases—that is, gets lighter in over-all density—a corresponding increase exists, but limited range in the amount of ambient light tolerated at minimum viewing levels. Relationships between screen minimum ambient light viewing levels and color film relative opacities were similar to those found in black-and-white films.

4. Maximum screen ambient light levels and color film relative opacities show a negative correlation. In general, as color film relative opacities decrease—that is, get lighter in over-all density—a corresponding decrease (darkening) exists, but limited range in the amount of screen ambient light tolerated at maximum viewing levels.

Screen Ambient Light Ranges

Although minimum and maximum screen ambient light levels were set for all black-and-white and color films in the study, major attention was given to the maximum level end of the ranges because of its implications in the understanding of classroom projection needs.

1. The range of the maximum screen ambient light level means for *black-and-white* films was found to be .15-5.98 foot-candles. With 12% of the maximum screen ambient light level means falling within the 0–.5 foot-candle frequency interval, classroom light control facilities will be required capable of reducing ambient light at the screen to .15 foot-candles.

2. The range of the maximum screen ambient light level means for *color films* was found to be .03-1.38 foot-candles. Since better than 11% of the maximum screen ambient light level means fall within the .15-.25 foot-candle frequency interval, classroom light control facilities will have to be capable of reducing ambient light at the screen to .15 foot-candles.

IMPLICATIONS OF THE STUDY

1. *Need for evidence on classroom physical conditions necessary for projection—*

The building of public schools requires communication and understanding among the public, school boards, school officials, architects, and builders. One of the prime reasons for nominal attention to the problem of classroom light control is the lack of objective evidence relative to darkness levels necessary for adequate classroom projection. This study has demonstrated that, for 11% to 12% of the films most commonly used in California public schools, a screen ambient light level of only .15 foot-candles on the screen is judged to be highly desirable.

2. *This study has specific implications relative to the light control problem, which are as follows:*

a. *Variability in motion picture films*—Claims of success with the showing of any particular film under semidaylight conditions in a classroom are not sufficient evidence to eliminate the need for classroom light control facilities in the classroom. This study has reported wide variability in both black-and-white films and in color films; a method of measuring relative opacity has been determined; and a range of variability in both black-and-white and color films has been reported. Variability has also been established between the duplicate prints of a film title. *All of which proves the necessity for adequate classroom light control.*

b. *Relative opacity—screen ambient light range relationships*—Evidence supporting a relationship between the relative opacity and the maximum and minimum viewing levels for both black-and-white and color motion picture films has been reported in this study. By the establishment of a relationship supported by evidence between relative opacity and maximum screen ambient light viewing levels for 16mm educational motion picture films in the classroom, producers of such films could, through further experimentation, establish specific tenable opacity ranges for providing optimum projected images of motion picture films in classrooms.

c. *Screen ambient light ranges*—Verification of specific maximum screen ambient light levels for projecting educationally acceptable images in a classroom is perhaps the most significant finding in this study. Little evidence was found where darkness levels required for projecting acceptable classroom images had been set, and where a variable in the material being projected was known. With the relative opacity variable known, predictions of necessary screen maximum ambient light viewing levels can be made for films falling within the identified relative opacity ranges. *The identified required screen maximum viewing of .15 foot-candles for both black-and-white and color motion pictures can be supported and recommended to architects, builders, school boards, school administrators, audio-visual directors, and other interested persons, as a necessary specification in the planning and building or remodeling of educational classrooms.*

SELECTIVE PERCEPTION IN VIEWING A TELEVISION BROADCAST

● WILLIAM A. BELSON

This paper is based on an address to the British Psychological Society at St. Andrews, Scotland, in March 1957. William A. Belson is Senior Psychologist in the Audience Research Department of the British Broadcasting Corporation, London.

RECENTLY the BBC broadcast a series of six television programs under the general title of "We the British: Are We in Decline?" Audience Research was called in to study the effects of two of them. The inquiry was conducted as a straightforward check on whether or not certain educational aims had been achieved, and the results were written up in that context.

There was, in fact, a substantial degree of failure to achieve these aims. Moreover, this failure seemed to be so much a feature of selective perception on the part of the viewers, that a separate statement, slanted in that direction, seemed desirable. And this is substantially what follows. The selectivity appears to have been of a special kind. In order to stimulate viewers' thinking on a controversial issue, the broadcaster had presented all sides of that issue. This traditional approach of the educationist seems, however, not to have enlivened the viewers' thinking, but to have increased selective perception and thereby to have entrenched existing attitudes and ways of thought. This particular statement is essentially speculative in nature, but the general run of the evidence does suggest that the broadcaster seeking to use television for the purposes of mass education has problems to overcome more serious in nature than is generally supposed.

Aims of the Series and of the Research

The series, as broadcast, aimed at comparing the Britain of today with the Britain of 50 years ago, bringing out and commenting on the nature of the changes over that half century. Under its general title, the first five broadcasts dealt successively with "Britain as a World Power," "Our Economic Life," "Industrial

Output and British Attitude Towards Work," "Our Moral Standards," and "Our Religious Faith." The sixth was a summing up. The two broadcasts chosen for special study were "Industrial Output and British Attitude Towards Work" and "Our Moral Standards."

Naturally, the primary aim of the series was to attract and to interest as many viewers as possible. But in addition it was intended:

1. to give viewers information;
2. to increase their awareness that changes have occurred;
3. to increase viewers' understanding and knowledge of these changes, giving them firmer grounds for an opinion;
4. to stimulate people into thinking about the subjects dealt with, and to encourage them to adopt more vigilant attitudes towards them.

Standard research methods indicated that each broadcast was seen by about a third of the adult television public, and that the level of appreciation achieved was very high. Special methods had to be used, however, to determine its success with its other aims (as set out above).

RESEARCH DESIGN FOR MEASURING EFFECTS

Anyone seeking to measure the effects of a broadcast is up against two serious problems. One is that the measurement must be based upon completely normal viewing—i.e. that the people who will eventually act as a sample should not have any idea at the time of seeing the broadcast that they will subsequently be asked questions about it by research workers. The second is that it can be extremely difficult to isolate genuine effects from all the other things which can influence the viewers' responses.

The method which I have been using for this kind of work is called the Stable Correlate technique. It has been described in detail in an earlier paper, but the general procedure in this instance was as follows. It is convenient to illustrate it through the first of the two broadcasts under study.

Securing the Subjects

On the day following the broadcast, a street and house survey was made, in which people were asked which broadcasts (if any)

they viewed the night before. A check list (for prompting) was used. There was no special mention of "We the British," and no mention of purposes. Names and addresses and personal details were recorded, and this made it possible to pick two samples of people—a sample of those who had seen the broadcast *in the normal course of events at home* and a sample of those who had *not* seen it. Within several days of this survey, these people received invitations to attend a meeting in Broadcasting House. There was no reference in the invitation to the broadcast under study, though the invitees were told, quite correctly, that the meeting would include general discussion of programs.

They came in groups of 40-50 some 7 to 10 days after the broadcast, and went through a series of prepared tests. The test scores of people who *had*, and of people who *had not* seen the broadcast were recorded, and these were processed in the manner described below.

Precisely the same operation was carried out in respect of the other broadcast. Between the two inquiries, about 600 subjects were tested.

Isolating Effects

The processing was of a special kind. The difference between the test scores of the two groups (the viewers and the nonviewers of the broadcast) was interpreted as a combination of two things: of the effect of the broadcast itself *and* of original differences between them. For it is quite likely that those who elect to view a broadcast on a particular subject are different to start with from those who do not so elect. To isolate effect from original differences the Stable Correlate method was used.

It is really a development of matching procedure, but differs from the older method in that (a) the matching criteria are established empirically and their power (to match) is maximized, and (b) the matching itself is achieved through statistical adjustment of the scores of the nonviewers of the broadcast.

In principle, it involves asking and answering the following question: "What would have been the test scores of the nonviewers of the broadcast, had the latter been the same to start with as its viewers *in terms of the things which determine or are predictive of test score?*" The difference between this new score and the score of those who saw the broadcast is interpreted as approximating a

measure of the effect of the broadcast, though it is an essential feature of the method that a checking device is built into the design to show how complete the isolation of effect has in fact been.

The predictors or correlates of test scores are themselves developed through including a large number of *possible* predictors in the test procedure itself, and then using statistical procedures to select from them that combination which is most predictive of test score.[1] The selection of predictors is made solely through the test scores of the broadcast's nonviewers (since it is the nonviewer score which is to be adjusted). And naturally, the predictors or correlates selected must not themselves be open to influence by the program—i.e. they must be *stable*—for otherwise the matching process would result in a whittling away of the evidence of the effect itself.

Ordinarily, a fresh set of *stable correlates* must be developed for each separate variable being studied (for effect), and the matching procedure carried out anew for each. Thus in the study of the effects of the program on "Industrial Output and British Attitude Towards Work," four separate sets of stable correlates were needed, each set contributing to a separate isolation process: one for the measurement of the broadcast's effect on viewers' knowledge of the facts presented, one for attitude towards the British industrial effort, and so on.

BROADCAST A: "INDUSTRIAL OUTPUT AND BRITISH ATTITUDE TOWARDS WORK"

The Form and Content of the Broadcast

The broadcast opened with a number of voices commenting adversely on British industrial output, and particularly upon the attitude of British people towards work. The commentator in the series said that it was hard to evaluate these opinions because "you couldn't get any hard facts on the matter." He therefore set out to present the views of as many different people as possible, hoping that this would bring viewers nearer to a balanced opinion on the issue. This is what you might call the "all-sides-of-the-issue" approach and it is one commonly used when a controversy exists and where facts are hard to come by. The commentator went first

[1] Using the Wherry-Doolittle method. See H. E. Garrett, *Statistics in Psychology and Education*, 1947.

to a panel of workers and put a series of questions to them. He asked them, for instance:

- Do the people working with you work hard enough?
- Does the boss work hard enough?
- Do you feel that if you worked harder, too much of the result would go to the boss?
- Do you think that the people you work with would put more into their jobs if they were more afraid of the sack?

The commentator then took these opinions—and others—to a number of people in industry. He went to four trade unionists, an industrialist, and the (then) chairman of the British Productivity Council. Finally, the commentator summed up, adding his own views.

In this way, a number of facts were presented, and a wide—and often conflicting—range of ideas and opinions were put forward. The rest was left to the viewer.

Method and Findings

The tests delivered were aimed at measuring the broadcast's effects on (a) the viewers' awareness about the issues discussed, (b) their ideas about the causes of decline, (c) their knowledge of the facts presented, (d) their general attitude towards work and industrial output.

Active awareness of decline in the industrial scene—The method used was to ask the subjects to spend up to 10 minutes in writing down *any* ways in which they thought Britain had "gone down" over the last 50 years. At this point the purpose of the meeting had not been explained and there was no prompting whatsoever (subjects being asked to regard the process as something of a mystery for the time being). Accordingly, the results yielded could be taken to represent what the subject was already aware of.

The program produced a substantial increase in awareness so defined. Thus, before the broadcast[2] some 29 percent were aware that Britain's industrial position in the world had declined; after viewing, the figure was 44 percent. On this point it is very much worth noting that all the speakers were agreed that such a decline had occurred. As to the *causes* of the decline, however, there was no such agreement and the results were very different.

[2] This is based upon the adjusted score of the (matched) group which did not in fact see the broadcast. The terms "before" and "after" are used for convenience.

The causes of industrial decline—In the broadcast, the commentator put special emphasis on certain things as *causes* of industrial decline: (a) that there exists a "two-sides-to-industry" mentality which stands in the way of a collective effort by management and employees, (b) that there is a lack of individual effort or willingness to work, (c) that British industry does not adapt quickly enough to changing methods and conditions. But the commentator's were not the only views expressed. The four trade unionists and the industrialist had variously laid the blame on "inadequate technical equipment," "inefficient use of labor," "inadequate channels for the expression of the workers' point of view," "Communism," "the apathy of the public to certain malpractices in industry (by trade unions and by the bosses)."

Analysis of test results indicated that the program had produced no spectacular changes in the frequency with which these ideas were nominated. Nor did it increase the *number* of ideas (of any kind) volunteered by each viewer. At the same time, such changes as did occur tended to relate to the commentator's three points—which were raised repeatedly throughout the program.

During the test procedure, the questions were progressively narrowed from causes in general to specific causes. Thus questions were eventually put about "attitudes towards work" (as a cause). Viewers were asked what was wrong with our attitude towards work and (later) what was to blame for this.

As can be imagined, this was not an area of agreement between speakers. They disagreed, and their approaches were quite different. On the tests made, there was little evidence of change in viewers' ideas on this score. Thus both before and after the program about 15 percent denied that there was anything wrong with "our attitude towards work," about 48 percent said that "we are not prepared to work hard enough," 20 percent that the "workers want too much for too little," and about 7 percent blamed the "two-sides-to-industry" mentality.

There was one point however where the pattern of effect was different. The proportion blaming "unwillingness to work" upon "increased cost of living or taxation" rose sharply. And it's worth noting that amongst the causes named by parties in this broadcast, this was the *one* where there was no element of disagreement. Moreover, the change occurred more with the upper half of the population (occupation-wise) than with the lower.

Another of the questions asked was about "what got in the way of collective effort by management and labor." This was what the commentator called the "two-sides-to-industry mentality." He blamed it on high profits, inadequate management, and lack of say by the workers over the way industry is run. To these, the others added between them "poor lines of communication in industry" and "disruptive tactics by Communists."

On this issue, the result was no change in the *number* of the viewers' ideas. The program did, however, increase the proportion who answered rather vaguely to the effect that there was "a lack of understanding between workers and management"—which, interestingly, was the one thing the speakers in the program had in common.

Attitudes towards Britain's industrial position—Questions were also put to gauge viewers' attitudes towards Britain's industrial position. Did the broadcast make people more concerned about it? Did it reduce such feelings as existed of hopelessness about changing that position? Did it reduce complacency? The tests were made through a large number of statements to which the viewer indicated the extent of his agreement or disagreement. The results made it fairly clear that while these attitudes were held by only a minority (about 20 percent on the average) the broadcast did not reduce their number. Against this I think it is worth saying that the suggestion that the British were complacent or too conservative was strongly contested amongst the various speakers. And I am tempted to hypothesize a cancelling out effect.

Knowledge of the facts presented—The facts presented dealt with (a) the number of hours per week worked in Britain since 1914, the present position being compared with that in America; (b) the number of man-hours lost in labor disputes since 1913. They were presented by means of graphs. Questions were put about six of them. Taking the average for the whole six, there was no increase in viewers' knowledge. Indeed, with three of them, there were actual decreases in viewers' ability to give out the information as broadcast. Thus *before* the broadcast, 40 percent agreed that the hours of work in Britain were at least equal to those in the USA; *after* it, the figure was 34 percent. Again, 22 percent agreed *before* and 17 percent *after*, that the hours of work (in Britain) at present are the same as in 1938. Guessing at why is an extremely dangerous activity, but all the same it is worth noting (a) that all speakers agreed that the industrial position had de-

clined over recent years (and presumably since 1938); (b) that Britain's loss of leadership to America was generally implied and was not disputed. Each condition seems to suggest something other than the commentator's facts.

The full report offers further instances of this kind. And generally speaking, two things seem to stand out. The first is that there was little change in the number or nature of the viewers' ideas where the speakers were in disagreement, but that there was a tendency towards change where there was no conflict. The second shows up in a more detailed analysis of the results. It is that where change occurred, it occurred more in the social group where that view tended to exist already—suggesting a form of partisan intake.

Generally speaking, this sort of result should not be surprising to psychologists. Selective perception is nothing new. But for the broadcaster, this only accentuates the problem. If the broadcaster is committed to an "all-sides-of-the-issue" approach, how can he broaden people's thinking on an essentially controversial issue? The tug of war of ideas which this involves seems not to produce a growth of ideas. What alternative has he, which is still educational in spirit—and which yet must attract and hold people?

PROGRAM B: "OUR MORAL STANDARDS"

The second program we studied brought out, also quite incidentally, more evidence suggesting selective perception. This was the program on "Our Moral Standards."

The Form and Content of the Program

This broadcast began with a film depicting various aspects of morality in Britain today. This was followed by a session in which members of the public (making up a panel) gave their opinions on points put forward by the commentator. Later on, there was discussion, between the commentator and a magistrate, over these opinions. And they went on to talk about moral issues generally. In this, the magistrate opposed strongly any suggestion that morals had declined. The commentator finally summed up, interpreting the position as he saw it. The moral standards dealt with in the program were:

1. Sex morality with references to: the use in commerce of sexy advertisements and of indecent pictures; prostitution; sex

perversion; sex relations outside marriage; illegitimacy; divorce rates.

2. Petty dishonesty, with references to: shoplifting; fare evasion; theft from employers and from nationalized industries; tax-dodging.

3. Crime, traffic accidents, gambling.

All of these were presented as areas of decline. On the improvement side, the program dealt with:

4. Social conscience, with references to: treatment of the aged, the disabled, and those in difficulty; orderliness; soberness; cleanliness; citizenship; kindness to animals.

Before setting out the results for this broadcast, it is important to press three points about the presentation of the program. The *first* is that the number of instances given of decline far outweighed the number of instances given of improvement. The *second* is that the viewer himself was likely to have been involved in this issue, feeling, naturally enough, that his morals were all right. The *third* is that in the discussion between the commentator and the magistrate, the magistrate came in strongly with the view that morals had *not* declined, and gave instances of improvement.

Method and Findings

The first point studied was "awareness of change." The program produced only small change in the degree to which viewers named moral standards as an area of decline (15 percent *before* and 18 percent *after*). Notice here that in the other broadcast, the question of decline was *not* in dispute. Here, it certainly was.

Knowledge of the facts presented was increased by about 4 percent, though there was wide variation when it came to the individual facts tested—large increases with several, no change with others, and losses with a few of them. One of these losses is specially interesting. As an illustration of the way old people are looked after better now, "we saw old folk receiving charity—in the form of food." The result would be consistent with a theory that this convinced a good many viewers that things were not so good for the aged after all.

In terms of attitude, the broadcast made people somewhat more permissive—more easygoing—about moral standards, especially those concerned with sexual morality. It also increased very slightly the number taking an absolutist view of morals.

In addition it affected the number and direction of ideas which the viewer could give when questioned. On the average, there was a slight increase in the number of the viewers' ideas about what was right and what was wrong with our moral standards these days. But this increase is of a special kind. It increased, by nearly 50 percent, the number of instances of *improvement* the viewer could give. And it *reduced* his mention of instances of decline. The evidence is not crucial, but it has a look of "selectivity against odds." The viewer came to the program able to give many more instances of *decline* than of improvement. He was presented with fewer instances of improvement than of decline. He went away from the program with something like an equal balance of the two.

SUMMING UP

Each of these two studies was designed as a straightforward check on the effects of a broadcast. Certainly there was no intention to make them yield unambiguous information about selective perception. Accordingly, the case I have been putting is no more than a by-product of the inquiry, and it must rank simply as an hypothesis.

Nonetheless, I feel that it is suggestive enough for very serious consideration and, perhaps, for special study. Certainly I finished work on the inquiry with a strong feeling about the power of viewers to perceive or interpret with an automatic selectivity where their own ideas were involved. I felt that television was offering special scope for this sort of thing, and I felt, too, that the traditional "all-sides-of-the-issue" approach was increasing the chances of it happening.

The problem which had begun to grip me was how to stimulate thought and ideas on a controversial issue without abandoning the vital principle of presenting all sides. And for the broadcaster wanting to use television for mass education I feel that this must be a matter of special importance.

REFERENCES

1. BELSON, WILLIAM A. "A Technique for Studying the Effects of a Television Broadcast." *Journal of Applied Statistics.* Volume 5, No. 3, 1956.

2. BRITISH BROADCASTING CORPORATION. "We the British: Are We in Decline?" VR 56:660. An Audience Research Report. London: the Corporation, 1956.

DOCTORAL DISSERTATIONS IN AUDIO-VISUAL EDUCATION: SUPPLEMENT I

• JOHN MOLDSTAD

This is the first annual supplement to "Doctoral Dissertations in Audio-Visual Education," published in the Fall 1956 issue of AUDIO-VISUAL COMMUNICATION REVIEW. *John Moldstad is assistant professor of education and assistant in research at the Audio-Visual Center, Indiana University.*

THE FALL 1956 issue of AUDIO-VISUAL COMMUNICATION REVIEW contained an article by the author listing 459 titles of doctoral dissertations in audio-visual education. This compilation was an attempt to include all doctoral studies completed from the beginning up to March 1956.

This past September a letter and accompanying form was sent to deans of schools of education and heads of departments of education in all United States institutions which grant doctoral degrees in education. Deans of graduate schools, schools of journalism, and schools of communication also received letters if it was felt that doctoral theses in the area of audio-visual education might have been completed at these institutions. These letters requested additions and corrections to the original Fall 1956 list plus new entries completed between March 1956 and September 1957.

Recent issues of *Doctoral Dissertations Accepted by American Colleges and Universities,* and *Dissertation Abstracts* were also checked as was Phi Delta Kappa's *Research Studies in Education—1956.*

SCOPE OF THE BIBLIOGRAPHY

Types of doctoral dissertations used in delineating the basic compilation included: (a) studies dealing with the effects of audio-visual materials on learning, attitudes, and human behavior in general, with the term "audio-visual materials" used in a broad sense so as to include not only educational but also commercial films, filmstrips, radio, television, comics, graphs, charts, pictures, and such; (b) doctoral dissertations concerned with evaluative or analytical studies of audio-visual administration,

such as organizational structure, finance, selection, and distribution practices; and (c) other studies dealing with the structure and organization, content characteristics, audience, and effects of commercial and educational media of mass communication.

Dissertations included in this supplement were also selected on the basis of these same criteria.

METHOD OF CLASSIFICATION

Realizing that any classification of doctoral dissertations on the basis of title alone will inevitably produce some misclassifications, the author has, nevertheless, attempted to classify each bibliographical listing within the following broad categories:

A. Administrative

1. Administrative structure and practices—status and evaluation of audio-visual programs
2. School plant facilities—provisions for audio-visual education

B. Audience

1. Characteristics and habits—the characteristics and listening, reading, and viewing habits of various types of audiences
2. Methodology—audience research methods

C. Media and Materials

1. Content—studies of either the content of the media or of specific units of material or both
2. Nature, structure, history—analytical or survey approaches in these areas
3. Use and evaluation (nonexperimental)—programs of use in specific area; analysis and evaluation of materials and their uses

D. Effect Studies

1. Media—experimental studies dealing with the use of a specific medium or of media and analysis of the effects on a particular audience

2. Variables—experimental studies involving the following interrelationships:
   a. Stimulus constant and audiences or audience characteristics varied
   b. Stimulus varied and audiences or audience characteristics constant
   c. Both stimulus and audiences or audience characteristics varied
3. Utilization—experimental comparison of the effects of different methods of use of materials and/or media
4. Methodology—studies of methodology in appraising effects

E. Teacher Training

1. Methods and programs—audio-visual instruction as applied to teacher training
2. Teacher characteristics—attitudes regarding media and/or audio-visual instruction, and studies of desired competencies.

INTERPRETATION OF FINDINGS

The previous analysis revealed that the big impetus in doctoral research in audio-visual education began at the start of this decade and that the growth in the number of studies devoted to various aspects of this field has been most encouraging.

The author found 219 studies completed between 1951 and the end of 1955. The 93 new studies reported as completed in 1956 and through September of 1957 point to the ever increasing interest in this field as an area for doctoral research.

Table 1 contrasts the percentage of doctoral studies completed in various categories before 1956 with the percentage completed from 1956 through September 1957.

Within the limits of classification previously noted, there appears to be little change in the types of doctoral studies recently completed as compared with those completed before 1956. There seems to be some slight increase in percentage of content analysis studies as well as an apparent slight decrease in the percentage of media and variable effect studies, but these changes may not be significant.

TABLE 1—PERCENTAGE CLASSIFICATION OF DOCTORAL DISSERTATIONS IN AUDIO-VISUAL EDUCATION

Categories	Percentage Classification of Completed Studies	
	Up to 1956	From 1956 to September 1957
A. Administrative		
1. Structure and practice	12.8	10.8
2. School plant facilities	0.0	3.2
B. Audience		
1. Characteristics and habits	5.8	5.4
2. Methodology	0.6	1.1
C. Media and Materials		
1. Content	4.3	9.7
2. Nature, structure, history	6.6	6.5
3. Use and evaluation	33.9	33.3
D. Effect Studies		
1. Media	17.4	14.0
2. Variables	10.1	7.5
3. Utilization	4.1	4.3
4. Methodology	0.4	0.0
E. Teacher Training		
1. Methods and programs	2.7	3.2
2. Teacher characteristics	1.2	1.1

Upon studying the listings of the 93 new studies, it is apparent that television has realized its share of studies. Thirty-three of the 93 doctoral researchers were concerned with some aspect of this medium and its role and possibilities for formal and informal education.

DOCTORAL DISSERTATIONS IN AUDIO-VISUAL EDUCATION

Supplement I

The abbreviations in parentheses refer to categories defined in Method of Classification.

(D–1) 1. ANDERSON, GEORGE RUSSELL. *Visual-Tactual Devices: Their Efficacy in Eighth Grade Arithmetic.* Pennsylvania State University, 1957.

(C–3) 2. ARNOLD, GENEVIEVE. *The Use of Headphone Listening and Immediate Playback in the Correction of Functional Articulatory Defects.* University of Houston, 1955.

(C–3) 3. AUSTIN, GARNET L. *The Use of a Film in Teaching Fraction Concepts.* Colorado State College, 1955.

(B–1) 4. BAILYN, LOTTE. *Mass Media and Children: A Study of Exposure Habits and Cognitive Effects.* Radcliffe College, 1956.

(C–1) 5. BARD, ISAIAH SIDNEY. *Section 315 of the Communications Act of 1934 and the Presidential Election of 1952.* New York University, 1956.

(A–1) 6. BENDA, HAROLD W. *A Plan for the Improvement of the Pre-Service Course in Audio-Visual Education for the State Teachers Colleges of New Jersey.* New York University, 1956.

(C–3) 7. BERGESON, CLARENCE O. *Problems in Using Audio-Visual Materials in Selected Junior High School Core Courses.* Columbia Teachers College, 1956.

(C–3) 8. BLAKELY, W. PAUL. *A Study of Seventh Grade Children's Reading of Comic Books as Related to Certain Other Variables.* State University of Iowa, 1957.

(B–1) 9. BLOOM, SAMUEL WILLIAM. *A Social Psychological Study of Motion Picture Audience Behavior: A Case Study of the Negro Image in Mass Communication.* University of Wisconsin, 1956.

(D–3) 10. BRANDON, JAMES R. *The Relativeness of the Lecture, Interview and Discussion Methods of Presenting Factual Information by Television.* University of Wisconsin, 1956.

(E–1) 11. BROWN, WALTER LOUIS. *An Investigation To Determine the Effectiveness of a Course in the Preparation of Inexpensive Instructional Materials.* Indiana University, 1956.

(C–3) 12. BURNETT, FRANCES LOWELL. *The Application of Sound Recording to Museum Natural History Exhibits.* Cornell University, 1956.

(C–3) 13. CAMP, MAURICE BERT. *Some Factors Related to the Utilization of Audio-Visual Materials, with Suggestions for Teacher Preparation in this Area.* Pennsylvania State University, 1957.

(D–2) 14. CAPARO, THOMAS C. *A Study of the Effects of Class Size, Supervisory Status, and Two Way Commu-*

nication upon Learning and Attitudes of AFROTC Cadets in a Closed Circuit Instructional Television Program. Pennsylvania State University, 1956.

(C–3) 15. CARTER, RICHARD FREMONT. *Perceived Appeals of Television Program Content.* University of Wisconsin, 1957.

(D–1) 16. CHAMPA VALENTINO ANTHONY. *Effectiveness of Television in Ninth Grade Science Classroom Teaching.* Pennsylvania State University, 1957.

(A–1) 17. COCHERN, GEORGE W. *A Study of Production Costs and Certain Utilization Problems Involved in the Distribution of 16mm Film Information on File Cards as Compared with Bound Catalogs.* Syracuse University, 1956.

(C–3) 18. COHEN, SAMUEL. *A Study of the Utilization of Audio-Visual Equipment and Instructional Materials under Highly Desirable Conditions.* Columbia Teachers College, 1956.

(C–1) 19. COOPER, BERNARD. *Radio Broadcasting to Chinese and Korean POW's: A Rhetorical Analysis.* Stanford University, 1956.

(C–1) 20. CORDIER, HUBERT V. *Campaigning in Television; The Speaking of Senator Paul Douglas in the 1954 Campaign.* University of Illinois, 1955.

(C–2) 21. CULPEPPER, MARILYN MAYER. *A History of Radio Broadcasting at Michigan State College, from August 1922 to January 1954.* University of Michigan, 1956.

(A–1) 22. DEL ROSARIO, OSEAS A. *A Proposed Audio-Visual Program for Schools and Colleges in the Philippines.* Indiana University, 1955.

(A–2) 23. DENNO, RAYMOND EDWIN. *Classroom Screen Ambient Light Ranges for Projecting 16mm Motion Picture Films.* University of California at Los Angeles, 1956.

(D–2) 24. DRISCOLL, JOHN PARKE. *The Comparative Effectiveness of High and Low Degrees of Visual Reinforcement of Concepts in a Survey Course in Education Utilizing Two Class Sizes.* Pennsylvania State University, 1957.

(C–3) 25. DUNNING, WILLIAM. *Designing, Constructing, and Evaluation of an Arithmetic Counting Device.* University of North Dakota, 1956.

(C–3) 26. EIDSON, WILLIAM PATTON. *The Role of Instructional Aids in Arithmetic Education.* Ohio State University, 1956.

(C–1) 27. ELEVAZO, AURELIO OBEDOZA. *A Content Analysis of Films Dealing with Educational Guidance in High School.* Indiana University, 1956.

(C–3) 28. ERSLAND, ERMA IOLITA. *A Study of the Use of Tape-Recordings in Teacher Education.* State University of Iowa, 1955.

(C–3) 29. EVERETT, MARGARET ELIZABETH. *A Film for Use in Developing Ability To Analyze Common Elements in Sports Skills.* State University of Iowa, 1957.

(C–3) 30. FRANK, JOSEPH HENRY. *An Evaluation of Closed Circuit Television for Interceptor Pilot Training.* Indiana University, 1955.

(B–1) 31. FREDERICKS, CARLETON. *A Study of the Responses of a Group of Adult Female Listeners to a Series of Educational Radio Programs, Volumes I and II.* New York University, 1955.

(C–1) 32. FRITZ, JOHN OTTO. *Film Persuasion in Education and Social Controversies.* Indiana University, 1957.

(C–3) 33. FROST, HERBERT HAMILTON. *A Plan for the Use of Factual and Visual Materials in Teaching the Vertebrate Fauna of Idaho with Emphasis on Conservation.* Cornell University, 1955.

(D–1) 34. FULLBRIGHT, JOHN B. *An Experimental Study of the Relative Effectiveness of the Use of Pictures for Teaching Selected Basic Language Skills at the Sixth Grade Level as Compared with the Effectiveness of the Procedures Outlined in the Textbook Manual.* Colorado State College, 1957.

(D–2) 35. FULLERTON, BILLIE J. *The Comparative Effect of Color and Black and White Guidance Films Em-*

ployed with and Without Anticipatory Remarks upon Acquisition and Retention of Factual Information. University of Oklahoma, 1956.

(A–1) 36. FULTON, WILLIAM RAY. *An Evaluation of Selected Aspects of the Organization and Administration of Oklahoma's Audio-Visual Program.* Oklahoma State University, 1955.

(D–1) 37. GASNER, LAWRENCE D. *An Experimental Study of the Relative Effectiveness of Picture-Continuity with Print-Continuity Using Science Literature at the Seventh and Eighth Grade Level.* Colorado State College, 1955.

(D–1) 38. GLOCK, JOHN W. *The Relative Value of Three Methods of Improving Reading — Tachistoscope, Films, and Determined Effort.* University of Nebraska, 1955.

(D–1) 39. GOLDSTEIN, NAOMI SLUTSKY. *The Effect of Animated Cartoons on Hostility in Children.* New York University, 1956.

(D–2) 40. GOODER, GLENN G. *An Experimental Study of the Influence of Varying Lengths of Commercials and Varying Audiences' Sizes on Effectiveness of Television Commercials.* University of Southern California, 1952.

(C–1) 41. GREGG, ROBERT LEROY. *America's Town Meeting of the Air, 1935-1950. A Critical and Rhetorical Analysis.* Columbia University, 1957.

(D–1) 42. HARRIMAN, BYRON LYNN. *Influence of Group-Centered Therapy and Mental Health Films on Attitudes of Prisoners.* Pennsylvania State University, 1956.

(E–2) 43. HAYCOCK, RUTH CAMELLA. *Audio-Visual Competencies Needed by Religious Education Workers in Protestant Churches and Pre-Service Training in These Competencies.* Syracuse University, 1956.

(C–3) 44. HAWORTH, MARY ROBBINS. *An Exploratory Study To Determine the Effectiveness of a Filmed Puppet Show as a Group Projective Technique for*

Use with Children. Pennsylvania State University, 1956.

(C–3) 45. HEARLD, JAMES E. *An Evaluation of an Experimental Program in the Use of Closed Circuit Television for Secondary School Teaching.* Northwestern University, 1957.

(C–3) 46. HEATH, HARRY EUGENE, JR. *College Level Telecourses for Credit: An Examination of a New Aspect of Adult Education with Special Emphasis on the Activities of WOI-TV.* Iowa State College, 1956.

(C–1) 47. HEIDEMAN, PAUL JOHN. *A Study of the Relationship Between Televiewing and Reading Abilities of Eighth Grade Students.* University of Minnesota, 1957.

(C–3) 48. HIMMLER, M. L. *An Analysis and Evaluation of a Television Demonstration of the Teaching of Fifth Grade Reading, Arithmetic, and French.* University of Pittsburgh, 1956.

(C–1) 49. HOOD, LEON CRIST. *The Programming of Classical Music Broadcasts over the Major Radio Networks: An Analysis of the Extent of the Supply by the Four National Radio Networks over the Past Seventeen Years of Programs of Standard Orchestral Music as a Function of the Public Interest in the Demand for Serious Music.* New York University, 1955.

(A–1) 50. HOPKINSON, SHIRLEY LOIS. *Audio-Visual Programs in California Public School Districts.* University of Oklahoma, 1957.

(D–1) 51. HUBBELL, LAWRENCE FREDERICK. *An Investigation in the Use of the Filmstrip Method, the Pupil Activity Method, and the Text Method in Presenting Science Concepts to Eighth Grade Pupils.* Northwestern University, 1957.

(C–2) 52. IAAO, JOSEPH ANTHONY. *A History of the Use of Certain Types of Graphical Representation in Mathematics Education in the Secondary Schools of the United States.* Columbia University, 1957.

(A–1) 53. INGRAHAM, LEONARD W. *An Audio-Visual Rationale and Manual for the Social Studies Department of George W. Wingate High School, New York City.* Columbia University, 1957.

(D–3) 54. JORGENSEN, ERLING. *The Relative Effectiveness of Three Methods of Television Newscasting.* University of Wisconsin, 1955.

(A–1) 55. KEMP, JERROLD EDWIN. *Audio-Visual Production Activities in Selected School Systems with Recommendations for Improvement.* Indiana University, 1956.

(C–3) 56. KING, CHARLES EDWARD. *A Case Study of the Evaluation and Use of Special Television Programs as an Instructional Aid in Vocational Agriculture.* Michigan State University, 1955.

(D–2) 57. KLOPP, WILLIAM JOSEPH. *The Determination of the Relative Merits of Three Methods of Teaching General Science in the High School.* University of Southern California, 1928.

(D–1) 58. LOFTHOUSE, YVONNE MARIE SHERIFF. *An Experiment with Closed-Circuit Televised Instruction in Teacher Education.* Wayne University, 1957.

(C–3) 59. LORENZEN, ROBERT L. *The Value of Certain Commercial Aids and Devices in Fourth Grade Arithmetic Instruction.* University of Kansas, 1956.

(B–1) 60. LYNCH, JAMES EDWARD. *A Study of the Size and Composition of the Viewing Audience of an Educational Television Program in the Detroit Metropolitan Area.* University of Michigan, 1955.

(C–3) 61. MARSHALL, WAYNE P. *The Effects of Projected Instructional Materials on Science Learnings by Selected Sixth Grade Students.* (Field Study Number 2) Colorado State College, 1955.

(C–3) 62. McDOWELL, VICTOR DALE. *An Evaluation of the Uses of Commercial Television as an Audio-Visual Aid in the Teaching of Social Studies in Selected Public Secondary Schools in the Chicago Area.* Northwestern University, 1956.

(C–3) 63. McKENLEY, MARJORIE MARIE. *Development and Use of Visual Materials for Training Food Service Employees in Work Simplification.* Iowa State College, 1956.

(C–2) 64. MACKEY, DAVID R. *The National Association of Broadcasters—Its First Twenty Years.* Northwestern University, 1956.

(C–3) 65. MAHONEY, JAMES HERBERT. *State Instructional Materials in Industrial Arts: Their Status, Content, Preparation and Use.* University of Missouri, 1956.

(C–2) 66. MILLER, EARL B. *A Historical and Technical Study in the Production of a Sound Filmslide "The Lincoln Trail."* University of Houston, 1957.

(C–3) 67. MILLARD, WILLIAM JOHN, JR. *A Study of the Sociology of Communications: Determinants and Consequences of Films in the Near and Middle East.* Columbia University, 1955.

(D–1) 68. MITNICK, LEONARD L. *Influencing Ethnocentrism in Small Discussion Groups Through a Film Communication.* University of Maryland, 1956.

(C–2) 69. MOREHEAD, HUBERT PERSHING. *The Educational Television Station in Higher Education.* Ohio State University, 1957.

(C–3) 70. MORRIS, JAMES MADISON. *Guides to Educational Television Programming and Their Application to the State of Oregon.* Oregon State College, 1956.

(B–1) 71. MUNN, MARK DEE. *An Investigation of the Differences Among Audiences of Several Radio Stations Broadcasting to the Same Population.* Ohio State University, 1957.

(C–3) 72. MURPHY, DONALD JOSEPH. *The Use of the Evaluative Technique in Determining the Effectiveness of the Instructional Materials Program in Selected Schools of the First Supervisory District of Erie County, New York.* University of Buffalo, 1956.

(B–2) 73. MYERS, LAWRENCE, JR. *An Examination of Television Audience Measurement Methods and an*

Application of Sequential Analysis to the Telephone Interview Method. Syracuse University, 1956.

(B–1) 74. MYREN, DELBERT THEODORE. *A Study of the Distribution of Mass Media Among Farmers and the Relationship of This Distribution to Certain Socio-Economic Characteristics.* University of Wisconsin, 1955.

(A–1) 75. NICOL, ALAN H. *Operation and Administration of a Program of Audio-Visual Education in the Buffalo Public Schools Since the Year 1900.* University of Buffalo, 1956.

(C–3) 76. O'BRIEN, MAYME LEE. *The Use of Audio-Visual Materials in Teaching Old Testament History.* Southwestern Baptist Theological Seminary, 1956.

(A–1) 77. O'MEARA, JOHN H. *The Foundation, Organization and Development of the Catholic Audio-Visual Educators Association.* New York University, 1957

(C–3) 78. OWENS, BLANCHE ELIZABETH. *A Film on Fundamental Procedure in Physical Education for Elementary School Classroom Teachers.* State University of Iowa, 1956.

(D–1) 79. PASEWARK, WILLIAM ROBERT. *The Effectiveness of Television as a Medium of Learning Typewriting.* New York University, 1956.

(B–1) 80. PEARLINK, LEONARD IRVING. *The Social and Psychological Setting of Communications Behavior: An Analysis of Television Viewing.* Columbia University, 1956.

(C–2) 81. PEIKERT, CECILIA H. *The Status of the Museum on College and University Campuses Having Accredited Schools of Education.* State University of Iowa, 1956.

(C–3) 82. PORTER, HAROLD WILLIAM. *An Investigation of Instructional Material Needs for Machine Shop Training.* Purdue University, 1948.

(C–3) 83. PORTER, LORENA RAY. *Construction of a Film as an Aid for Teachers of Primary Physical Education.* State University of Iowa, 1956.

(C–2) 84. POWELL, DONALD F. *A Survey of the Coverage Area of a Proposed Educational Television Station at the University of Kansas.* University of Kansas, 1955.

(D–1) 85. RICHTER, MARION. *Drawing and Learning in Biology: The Relationship Between Pupils' Drawings of Visual Aids and Their Learning in Biology.* Columbia University, 1956.

(C–3) 86. ROPER, KEITH IRL. *The Utilization of Industry-Sponsored Instructional Materials by Colorado High School Chemistry Teachers.* University of Colorado, 1956.

(D–1) 87. RUE, JAMES J. *An Experimental Study of the Relative Effectiveness of Certain Types of Radio and Television Commercials.* University of Southern California, 1954.

(C–3) 88. SALE, DAVID. *The Use of Materials in the Teaching of Arithmetic.* Columbia University, 1957.

(B–1) 89. SALLEY, HOMER ELLISON. *A Study of the Use of 16mm Films by Community Organizations with Special Attention to the Louisville Free Public Library as a Source of Films for Such Groups in Louisville, Kentucky.* Indiana University, 1957.

(C–3) 90. SCHLAAK, OTTMER FRANKLIN. *The Planning, Production, and Evaluation of Two Experimental Series of Classroom Telecasts for Use in the Intermediate Grades in the Columbus Ohio Area.* Ohio State University, 1955.

(A–1) 91. SCHOTT, WILLIAM J. *The Development of a Plan for Supervisor-Teacher Coordination in the Preparation of Instructional Materials for Vocational-Industrial Courses of Less Than College Grade.* New York University, 1954.

(D–2) 92. SCOLLON, ROBERT W., JR. *A Study of Some Communicator Variables Related to Attitude Restructuring Through Motion Picture Films.* Pennsylvania State University, 1956.

(C–3) 93. SEXTER, IRVING S. *A Manual for the Utilization of Sound Films and Television Programs by Coun-*

selors and Teachers of Group Guidance in Junior High Schools. New York University, 1956.

(D–1) 94. SIEGEL, ALBERTA. *The Effect of Film-Mediated Fantasy Aggression on Strength of Aggressive Drive in Young Children.* Stanford University, 1955.

(A–1) 95. SKELLY, HARRY J. *Audio-Visual Services in Counties of Northern California.* Stanford University, 1956.

(D–3) 96. SMITH, HAYDEN RICHARD. *The Effectiveness of Two Instructional Procedures in Comparative Education.* University of Michigan, 1957.

(A–2) 97. SNELLING, W. R. *The Selection and Evaluation of a Curved Chalkboard for Classroom Use.* University of Virginia, 1957.

(C–3) 98. STAHL, STANLEY SMITH, JR. *Development of an Enriched Visual Materials Program for the Beginning College Course in the Teaching of Reading.* University of Maryland, 1955.

(C–3) 99. STEIN, ELIZABETH M. *An Exploratory Investigation of the Use of Motion Pictures in the Treatment of Hospitalized Psychiatric Patients.* Pennsylvania State University, 1954.

(C–2) 100. STEWART, ROBERT HAMMEL. *The Development of Network Television Program Types to January 1953.* (Volumes I and II.) Ohio State University, 1954.

(C–3) 101. STROHBEHN, EARL FREDERICK. *A Study of the Instructional Materials Program in the Oak Ridge (Tennessee) Public Schools: Conception, Organization, Administration, Management, and Utilization.* University of Tennessee, 1956.

(C–3) 102. SUMMERS, ROBERT EDWARD. *The Role of Congressional Broadcasting in a Democratic Society.* Ohio State University, 1955.

(A–1) 103. TADENA, TOMAS P. *A Proposed Audio-Visual Program for the University of the Philippines.* Indiana University, 1956.

(D–1) 104. TAMMINEN, ARMAS WAYNE. *An Evaluation of Changes in Parents' Attitudes Toward Parent-Child Relationships Occurring During a Televised Program of Parent Panel Discussions.* University of Minnesota, 1957.

(D–3) 105. TATE, MARJORIE B. *The Comparison of Two Teaching Methods on Learning the Mechanics of Selected Body Movements.* State University of Iowa, 1956.

(C–3) 106. TAUFFNER, GILBERT. *The Design and Contribution of Flipchart Graphics to Teaching Concepts of Regression and Correlation in University Statistics Courses.* Syracuse University, 1955.

(C–3) 107. THORN, BURTON KELLOGG. *Problems Involved in Production and the Use of Appropriate Educational Telecasts by the Michigan Department of Public Instruction.* Michigan State University, 1956.

(A–1) 108. TINTERA, JAMES B. *An Analysis of the Administration of Educational Television in Institutions of Higher Learning.* Michigan State University, 1955.

(D–1) 109. TRUVOB, HERMAN. *An Experimental Study of the Effectiveness of a Mock-up of the 16mm Motion Picture Projector for Teaching the Threading of the Projector for Maximum Transfer.* Syracuse University, 1956.

(C–3) 110. TURNEY, BILLY LAWRENCE. *An Evaluation of Selected Teaching Aids for Plane Geometry.* University of Houston, 1957.

(C–2) 111. UDELL, GENE. *Closed-Circuit Television: A Study of a Developing Medium of Instruction.* Temple University, 1955.

(D–2) 112. ULRICH, JOHN HOLWAY. *An Experimental Study of the Acquisition of Information from Three Types of Recorded Television Presentations.* State University of Iowa, 1955.

(D–1) 113. WEBER, JOSEPH. *Comparative Effectiveness of Some Visual Aids in Seventh Grade Instruction.* Columbia University, 1921.

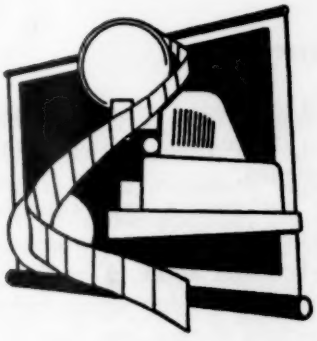
(A–1) 114. WEBSTER, HOWARD BISSELL. *A Critical Study of Administration Practices and Procedures of Audio-Visual Centers in Major State Universities.* University of California at Los Angeles, 1957.

(D–3) 115. WHITE, DORIS KATHRYN MAE GNAUCK. *A Comparison of Three Techniques Involving the Use of Visual Education Procedures in the Development of Entomological Vocabulary in Secondary School Science.* University of Wisconsin, 1956.

(C–1) 116. WILLIAMS, RICHARD H. *An Analysis of the Importance of Format to Educational Television Programs.* University of Wisconsin, 1956.

(C–1) 117. WIRT, FREDERICK MARSHALL. *State Film Censorship with Particular Reference to Ohio.* (Volumes I and II.) Ohio State University, 1956.

(C–1) 118. YEAGER, MURRY RUSSELL. *An Analysis of Edward R. Murrow's "See It Now" Television Program.* State University of Iowa, 1956.



FILM

• ROBERT W. WAGNER

THE INTERNATIONAL EDUCATIONAL FILM

I

While Sputniks and Explorers continue to hold the center of the stage as international spectacles, American entertainment films with globe-circling themes have created something of a spectacle in their own field.

Around the World in 80 Days, despite the poor taste of some of its publicity, was, in both story and method, symbolic of the international scope of U.S. film production and distribution. American film production crews, always active in far places of the world, have been everywhere during the past few years. *Sayonara* was shot in Japan, *The Pride and the Passion in Spain, The Seven Hills of Rome* in Italy, *Bonjour Tristesse* in France, *The Vikings* in northern Europe, and *The Bridge on the River Kwai* in Ceylon. Out of 288 pictures distributed by the leading companies in 1956, 55 were made in Europe, Africa, and Asia. In 1957, four of the five best films of the year included foreign stars, were shot overseas, and were independent productions.

Hollywood had, from its early beginnings, imported directorial and acting talent from Europe, but now the mountain seemed to be going to Mohammed. U.S. film makers were going abroad where production costs were comparatively lower, where "blocked funds" earned by American films exhibited in these countries could be used up, and where some savings on income tax might possibly be effected. Productions on foreign soil offered escape from the studio atmosphere; a chance to combine business with pleasure; the opportunity for the motion picture camera to capture

Robert W. Wagner is Professor and Director of Motion Picture Production at Ohio State University.

the scope needed for the wide-screen; and the vistas which its competitor, the television camera, chained to its coaxial or dependent on microwave relay, could not yet encompass.

Leading producers began to make statements rarely heard during the plush days of big studio production which now seemed to be at an end. Sam Speigel, on the television show, *The Seven Lively Arts*, said, for example, that location photography helps establish audience rapport because the actors themselves feel the impact of reality and are able to convey this feeling better when working in the actual locale of the story. He also remarked that the successful producer today must be both independent and "peripatetic"—prepared to travel, live out of a suitcase, and, like the followers of Aristotle who taught while strolling the Lyceum, able to think on his feet. And the late Humphrey Bogart summed up the importance of the international film audience itself when he quipped: "You're not a star until they can spell your name in Bangkok!"

The result of this growth of international spirit in the entertainment film field is reflected by the international film festival, international co-production, the co-starring of actors from several different countries, and, of course, by the fact that more than 50 percent of the returns from American-made films now come from abroad.

By way of contrast, the film whose primary purpose is to enlighten rather than to entertain has done rather poorly in the international field. Wilbert Pearson, Chief of the Attestation and Review Staff of the U.S. Information Agency, has pointed out that although the export of non-theatrical films has increased by more than seven times during the past 10 years, the total export of such films is still less than 2 percent of the gross of the non-theatrical film industry.[1] And Robert E. Brubaker, Director of Overseas Relations for Encyclopaedia Brittannica Films, once estimated that because most of our educational films are typically "American," not more than 25 percent of this country's total output of teaching films is really suited for use abroad.[2]

Despite 25 years of effort, and at least four international agreements drafted to solve the complicated problem of interna-

[1] Pearson, Wilbert H. "The 1956 Kenneth Edwards Lecture." *Journal of the University Film Producers Association* 9:6; Fall 1956.

[2] Brubaker, Robert E. "World Trade in Educational Film." *Sixty Years of 16mm Film.* Evanston, Ill.: Film Council of America, 1954. p. 170.

tional exchange of audio-visual materials for education; despite UNESCO's coupon system of payment for non-theatrical films, and the U.S. Information Agency's certification of educational materials for use abroad; despite cataloguing of educational materials by UNESCO, and the U.S. Information Agency's continuing effort to get U.S.-produced films shown through more than 200 overseas film libraries, and 350 mobile units; the flow of American films designed for school use abroad is still relatively small.

II

To the American educational film producer, still facing many problems of production and distribution on the home front, the foreign market involves a jungle of red-tape, currency differences, and added financial, production, and distribution problems. It costs roughly $500 to translate a 10-minute film to another language by conventional methods. Preview prints sent overseas may be tied up for a period of weeks or even months. Additional promotional expenses are involved. Music and other rights must be cleared for world-wide use. In some countries import duties and sales taxes total 28 to 60 percent of the value of the imported material. With the exception of a few of the larger production organizations, the American film producer lacks the contacts and the experience necessary to deal with national ministries of education which, in many countries, are responsible for the selection and purchase of all educational materials and equipment.

Motion picture film, production, and projection equipment are among the most internationally standardized products in the world. But there is a need for rugged, relatively inexpensive, and preferably optical-magnetic, 16mm projectors before educational films can be shown on a wide scale internationally. School systems in many countries, such as Chile, are just beginning to feel the need for good sound films in the classroom. Their present equipment, as in the case of many European countries, consists largely of silent projectors. There would seem to be a great opportunity for the manufacturer who can supply serviceable 16mm sound projectors which the educational systems of such countries can afford.[3]

[3] The U.S. Information Agency's Motion Picture Service has, in many countries, made 16mm sound projectors available on a loan basis in communities where, otherwise, no films could be shown at all. But it should be noted that the export of American-made 16mm cameras and projectors went down 15 percent during the first half of 1957, compared with the first half of 1956, according to the U.S. Department of Commerce.

There is the troublesome problem of translating an educational film, too. The theatrical film, though expertly "dubbed" in a foreign language, generally carries its message effectively through action situations. Such films usually contain a number of easily recognizable "cues"—type-casting, conversational dialogue, mood music, etc. Their themes are typically variations of familiar situations in which outcomes can generally be anticipated.

In the educational film, on the other hand, outcomes are often not known. There are fewer "cues," less anticipation on the part of the audience. Attention cannot be assumed. Motivation is often not built into the presentation, and the idea is seldom carried by action situations alone.

While there is no substitute for visual primacy in either the entertainment or the teaching film, there is generally a necessity in the latter for verbal interpretation to add depth or intellectualization to action situations. Words and their meaning assume primary importance in the straight talk by a scientist, in the interplay of opinion in the discussion film, in the explanation of a chart or animation illustration, and in concept-building. The interweaving and mutual enrichment of the verbal and the pictorial is an important element in the art of instructional film production, and in the translation of such films for use abroad.

Finally, the educational film producer's primary discipline is accurate communication, integrity of idea, exactness of concept, and objectivity of interpretation. He cannot assume that pictures—however interesting—will overcome barriers to international understanding. And he is no longer, as Seldes points out, "obsessed by the Chinese maxim about the picture being worth a thousand words." [4]

Because of social and cultural differences, and their many variations within a single national group, it is not easy to produce an internationally useful educational film, just as it is not easy to build any kind of international communication or understanding, however noble our intentions. As Emerson put it: "There is something deceptive about the intercourse of minds. The boundaries are invisible, but they are never crossed. There is such good will to impart, and such good will to receive, that each threatens to become the other; but the law of individuality collects its secret strength; you are you, and I am I, and so we remain." And

[4] Seldes, Gilbert. *The Public Arts.* New York: Simon and Schuster, 1956. p. 189.

Thackeray, philosophizing in *Pendennis*, pointed out that, ". . . a distinct universe walks about under your head and mine . . .; you and I are but a pair of infinite isolations, with some fellow-islands a little more or less near to us."

III

The important problem of our time is to bring human islands a little closer to each other. The entertainment film, which already enjoys an international audience, has sometimes served to illustrate facets of life with reasonable accuracy. In presenting material honestly and with insight, in producing films overseas in real situations, in choosing material which illuminates human conduct—whether the treatment be humorous or tragic—the producer of the entertainment film can serve an important and useful function.

But the primary purpose of the entertainment film is to amuse rather than to enlighten; to tell stories which may or may not be representative, which may or may not be based on fact, and which, to a large extent, require the right of poetic license to be realized at all. So while the dramatic film is typically universally entertaining, and while it has disseminated information on a world-wide scale, it often creates distorted pictures of various cultures and puts misinformation into attractive and believable form.

Concern over the negative impressions of life in the U.S. held by many Britons as the result of seeing American-produced films has been recently expressed by Edward L. Bernays and others. Commenting on this, Philip K. Scheuer, motion picture editor for the *Los Angeles Times*, sums up the problem of the American entertainment film's international effect in an article titled: "Do Films Harm Us Abroad?"

> Naturally, a matter like this touches all of us, perhaps particularly those who write about the movies. With anti-Americanism already rampant in so many countries, one may ask, are we too late? And then—are we ever too late?
>
> Let us not fail to consider that as our own sophistication grows, so, proportionately, does that of the rest of the world. Europe, especially, grew weary and cynical long before America was pounded by three wars into sharing the realistic view, and for decades Europeans thought of us as hicks, dreamers, or just babes in the woods. Surely the more intelligent among them cannot now seriously regard this movie or that as representing the American norm—any more than we judge France by *Rififi* or Brigitte Bardot or Italy's economic state by the poverty and squalor of its neo-realistic films!
>
> Maybe not by one or two Hollywood movies, you may answer—but the many?

I would be inclined to view with much more alarm the effect they may be having on the Africans and Asiatics. And what of this proposed "cultural exchange" with Russia? We may regulate what films we send them—but that would mean withholding some of the finest examples of our art. The Russians don't want sweetness and light.

Actually, Americans don't seem to want sweetness and light, either. We holler for family films and then won't pay to see them. And Europe—which is now half our market—rejects our musicals. What's left? Westerns!

As an American, I share the concern of Mr. Bernays. . . . But as a critic I cannot forget how long and how hard we have fought for the free expression of our art. The question is: When does free expression become harmful license?

The calendar counsels: Take the long-range view. But the ticking clock answers: It is later than we think. This is our dilemma.[5]

The fact that the American entertainment industry seems to be increasingly aware of "the ticking clock," and the international impact of its product is an encouraging sign. The developing pattern of independent productions, many of them shot overseas, the participation of industry representatives in international film festivals, and in meetings of international film organizations must certainly contribute to this sense of responsibility in terms of the political and social realities of our times.

Of greater concern to the writer is the desultory nature of the production and international distribution of the film whose primary purpose is to inform, instruct, and enlighten, rather than to entertain and amuse.

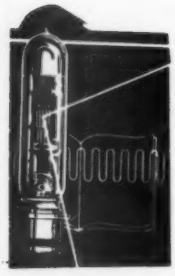
In the long run, the film that has the most direct and unavoidable responsibility for bringing "human islands" together is not the pure entertainment film, nor the film which attempts to "sell" this or that way of life, but rather the honest, skillfully-produced instructional, scientific, or documentary motion picture suitable for use in the educational systems of many countries. The writer, after talking to teachers and film makers in several nations, believes that such films are possible, and that we may realistically look forward to the day when there will be a series of educational film classics which, like classic literary works, will become known and used throughout the world.

The United States is doubtless the greatest storehouse of information on film in the world today, with unsurpassed facilities and talents for the production and use of the non-theatrical motion picture. And yet, however, the American non-theatrical industry

[5] Scheuer, Philip K. "Do Films Harm Us Abroad?" *Los Angeles Times*, February 23, 1958.

has not displayed the initiative and energy of the Hollywood producer who, despite economic, legal, and other obstacles which continue to arise, has succeeded in getting his films seen, and to a very large degree accepted, all over the world.

This is not intended to minimize the many problems which inhibit the production of educational films suitable for overseas use, or the many obstacles to their distribution. Rather, it is here suggested that the importance of such films in our times is tremendous, and that both the non-theatrical film producer and the educator should begin to look at the world both as the stage and the audience for the motion picture which deals with common basic knowledge, skills, and information in a humanly understandable and insightful way.



CURRENT DEVELOPMENTS IN COMMUNICATION

VISUAL METHODS IN THE SOVIET UNION

• DAVID JOHNSTON

This timely article was based on an interview given by David Johnston, advisor to teachers at The University of London Institute of Education, and is reprinted from the January 1957 issue of VISUAL EDUCATION *with permission.*

The party in which I went to Russia consisted of eight educationists. We went under the auspices of the Education Interchange Council at the invitation of the Ministry of Education of the Russian Socialist Republic, and our visit was in return for those paid by two parties of Russian educationists to this country. We were a mixed group which included a Director of Education, a Director of an Institute of Education, a Headmistress of a Grammar School, a senior science master in a Grammar School, an Inspector, the Principal of Ruskin College, Oxford, the Secretary of the Education Interchange Council, and myself.

We travelled in Moscow and Leningrad, and the country around both these cities, and also to Baku, the capital of Azerbaijan, one of the autonomous republics adjacent to the Caspian Sea. In all these places we visited *all* types of schools, most kinds of technical institutions, teacher training centres and university institutions. A programme was planned for us, but in each case the first session was devoted to discussion of the programme and we asked for certain items to be included and substituted for inappropriate visits. We certainly found no difficulty about making suggestions for the programme, though I admit that there were certain things that we did not succeed in seeing: for instance an E.S.N. school, a school for overgrown children, and the treatment of the older

juvenile delinquents and things of that sort. After all we were only there for one month and certainly found enough to do in that time!

Our contact with the people we met was through interpreters, but we also worked with teachers of English who spoke our language very well. We spoke very freely with children, who answered all our questions, and we had at least one member of the party who was very fluent in Russian—sufficient indeed to correct the interpreters on occasions!

What is the general attitude of educationists to visual aids?

I find it almost impossible to say that there is an attitude to visual education as a whole. In the Research Institutes and in the Pedagogical Institutes (where teachers are trained for five years) considerable insistence is placed on visual education as a mode of teaching. As I will explain later on this does get through to the schools, but there remains a proportion of Soviet teachers who know little about the use of film. There must be many schools where facilities do not exist because of the lack of electrical supply and so on, or where the tightness of the curriculum prevents them from extending their work into fields using visual education. On the whole the conviction that there is an intrinsic appeal in things visual is less important in the minds of all educationists than the content of the subject they are teaching. They are more interested in the common core of the curriculum which they are trying to teach. I think this can be explained by the fact that there is an "unselected" method of teaching children, who attend a common school from the age of seven to seventeen. In that common school there is a common curriculum, so that all children without grading or streaming of any kind (streaming is in fact illegal) pursue the same common core of study. So, if one is taking children in a remote part of the country through a syllabus identical to that being taken by children in Moscow, one will do as best one can. It may be that there are no visual aid facilities at all. As in this country, there are, of course, visual aids enthusiasts, who are concerned about the use of visual methods and would like to see the spread of the use of film. And in fact, any teacher who has a special interest in a point like that can make his views known through the most democratic (if I may use this seeming contradiction) organisation conceivable. Any teacher anywhere in Russia can write a paper on anything and have it discussed in the Regional Organisation. It can then be sent on to some Institute of

Education, and, if it is a good paper, the teacher will be invited to present it, and read it in person, to the Academy of Pedagogical Sciences in Moscow, where all major recommendations concerning education are made.

Can you give us any information about the number of films available, finance and production, and the research situation?

I am afraid it would be quite impossible for me to tell you the total number of classroom films available, but it will give some idea when I tell you that the annual production program of films for the teaching of science alone (i.e. including physics, chemistry, biology and probably physical geography) in 1956 was something in the order of 200 films! And, if one can judge by the examples we saw, they were good films.

I have no specific information about the method of financing production, but I don't think finance is *ever* an embarrassment for any organisation inside the Soviet Union. With the internal economy of the country as it is, if the decision is made by the appropriate committee that, for instance, the production of 200 films is important—then 200 films are produced! This is a feature of their whole attitude to the production of textbooks, or school furniture or anything else.

The films are produced generally in four major centres: Moscow, Leningrad, Kiev and Sverdlovsk. The production studios in these centres also produce, in addition to teaching films, certain types of documentary films. There are also some studios producing primarily documentary films, which also make some films which could be useful particularly for teaching scientific subjects at higher levels.

From the research point of view, the production programme is partly investigated by the Moscow Lomonosov Institute which has departments engaged primarily in investigation into film. From a teaching point of view, many educational films would be investigated by one or other of the research institutes which are affiliated to the Academy of Pedagogical Sciences, which as I have said is the body which plans in every aspect the educational service in the Soviet Union. These research institutes are immense organisations. Those we visited included one on educational research, with a staff of just over 100 and another on defectology (dealing with backward and handicapped pupils), with a staff of about 70. So research is mounted in this way, and interest in films is such that

research takes place in the hands of specialists who are primarily engaged in it.

There are also 45 Pedagogical Institutes (teacher training institutes) where at some time or other work with film is undertaken by students in training. These institutes are very big organisations. That in Leningrad had about 4000 students enrolled, of whom about 400, in the first year of their five-year course, had access to film equipment as part of their basic training. Whether they all became specialists in visual aids is, of course, another thing. The Ministry of Higher Education, which controls these institutes, would be consulted about the amount of the Institute's money which was to be spent on film production in comparison with the amount spent on other forms of research.

Can you tell us about the length of teaching films, the use of sound and colour, the methods of distribution to schools, and the way in which they overcome the problem of different languages which occur inside the Soviet Union?

I think in general, the consensus of opinion would be that sound film is preferable to silent, although the equipment they use is such that the teacher can, at any moment, substitute his own voice for the sound-track of the film, more or less as we do here. Normally the films which I saw were only one reel, though, if a film could not be compactly produced on one reel there was no argument about having a second reel or part of one. I saw no evidence of colour being used in educational films in Russia, though I have seen educational colour films from Russia in *this* country, so one cannot rule it out as a possibility. Again I saw no evidence whatever of 3D or the wide screen in classroom use. Indeed we saw a very practical set-up in the schools, in which most of the difficulties which we face in the use of these aids had been ironed out by rationalisation in one way or another.

The Russians do not use films from other countries in their schools—they have such an abundance of films of their own that they do not need them. They do, however, have access to foreign films through the Geneva library. But, of course, we would criticise their teaching about other countries as not always being objective; consequently films which would be a very good vehicle for conveying ideas about other lands may not be used for that very reason.

The distribution of films to schools falls into two categories. Certain schools, and there are quite a number of them, receive

copies of *every* film which is produced—and these films go into a school library for the use of that school alone. For the less favoured schools—probably those in areas where the population is sparsely spread and the schools are within a radius of 20 to 40 miles of each other—a regional film library is established. Even for those schools which have their own library, the regional library exists to supplement their stock of films available. Information about films is handed out by the Ministry of Education—"the following films are now available." So that any school either receives the film itself, or is informed that the regional library has it in stock.

There have been many films made in the languages of the autonomous republics, but in general educational films would be in the Russian language. Every child attending school in the whole of the Soviet Union is first of all instructed in his mother tongue. If his mother tongue is a language other than Russian, then he begins to learn Russian in the second grade, i.e., from the age of eight onwards. He will abandon the learning of his mother tongue at the age of 13 or 14, and instruction subsequently *may* be only in Russian, although we did see bilingual schools, in which pupils were streamed solely on their proficiency in Russian. There is no attempt made to blot out these mother tongues; in fact, they are encouraged to the point of policy being questioned on the grounds of nationalism. But it would be fair to say that almost every citizen of the Soviet Union becomes fluent in Russian through the influence of the Press and the Radio, in which Russian is the vehicle of communication.

The other point to make, of course, is that in addition to the mother tongue, all children learn a foreign language. This foreign language is English for 40 percent of children; German, 30 percent; and French, 30 percent. This applies to the whole Soviet Union from the Baltic to the Pacific. So that, if we ever thought of making English films available in Russia, one could assume that from the age of 14 onwards 40 percent of children would be sufficiently accustomed to the use of English to get something from the sound-track.

Are films used at all stages of education, are they used with all subjects, and can you give details of their actual use in a class?

I did not myself see films in use in a Primary school, though I had a description of their use in the teaching of language. It appears that the teaching of Russian in Primary schools has

been more concerned with the comprehension and writing of the language than with the quality of speaking it. They have, therefore, decided recently, that many of their films shall be used in Primary education for cultivating a better quality of speech—probably better than that used by some Primary teachers. In Secondary schools film is used for teaching such subjects as science and geography, in a manner which I will describe later, and to a more limited extent for athletics and a few other subjects. At advanced and University level there is a very free use of film, and the Russians probably produce very many more films suitable for advanced study than we do in this country. In general films are not used with the majority of subjects, but are confined mainly to science and geography. They are certainly not used at all in the teaching of foreign languages. They aim solely at facility on the tongue, and for this they use phonetics and drill processes, and the tape-recorder, about which I shall have a little more to say later. It is worth mentioning at this point that, so far as I could ascertain, the films were purely pedagogical and there was not the slightest suggestion of political propaganda anywhere in them. They were as functional as the Kodak film on the four stroke cycle gas engine—that is to say they showed something which could not be produced in the classroom by any other means.

As an actual example of the use of film in class, I should like to refer to the ten-year school which we visited at a place called Gurki-Leninski. It is a school in the Moscow region which we found had 588 pupils. It was probably a bit of a show school, because we were encouraged to visit it, but from what we saw elsewhere it seems to be fairly typical of its class of school. It provided the normal ten-year course; it had the normal number of people who try to leave at 14 instead of 17 (not very many!) and it had the normal proportion of people who repeated their course—that being a test of the success of a school in Russia.

I found that they had in the biology room a cine projector and a screen. The physics laboratory also had a whole collection of visual aids—in the store room they had two epidiascopes, two filmstrip projectors and two ciné projectors. One of the latter was being moved out for a lesson which we saw. Incidentally, we discovered that the school had its own film library in which there were just over two hundred films in the physics section which the teacher could use at will (and there was a similar number of films for geography also). On the demonstration bench at the front,

where the teacher was standing, was a switch panel. At one moment in the lesson when he wanted to introduce a film as an integral part of his lesson, the teacher walked three paces to the window and pressed a button. This started an electric motor and the blinds came down to black out the room. He then went back to the panel on his desk, where a very small pilot light was on, pressed another button and the lamp of the projector went on, and then pressed a further button and the motor started and the film was screened. When he wanted to stop the film to show a still he pressed another button and the film stopped. This was a little less successful because he had not re-focused, but it was enough to give a view. He then pressed a button again to restart the film to continue the showing. This remote control from the panel at the front of the class is a fairly general installation in those schools which are favoured with their own film libraries. The projector had been prepared and put in position not by the physics teacher himself, but by a laboratory assistant whose job it was to look after all the equipment in the lab., including the visual aids. The same facilities are available in that school in both the chemistry and biology laboratories. (This scale of equipment seems to be general—one school we visited had 10 ciné projectors alone.)

I asked if they had any filmstrips. In reply they opened the door of a wall cupboard about 18 inches deep, in which there were about six or seven shelves packed full of carefully indexed tins of filmstrips. The appartus in the room was so arranged that the teacher could simultaneously, or in the course of the same lesson, show ciné film, use filmstrip, or use the epidiascope without stopping the lesson. There was a screen in front, which pulled down from the blackboard, which would accommodate all three.

This school is one of those which will become a boarding school under the new experimental project which their Ministry is carrying out, and which I am convinced will be successful. In all boarding schools film is used just a little more actively than in other schools. The children are, of course, there for 24 hours a day, although they spend only from Monday morning to Saturday afternoon at school and go home for Saturday evening and Sunday. But in the meantime film plays a part in the social life of the school, and provides an opportunity for children to have things like a film club. In one of the other boarding schools we visited we went into a very charming assembly hall—about the only assembly hall we saw in Russia in fact—which had a projection box at the back with

five projection slits, though on interrogation I discovered that there was only one projector in fact. They had, however, a grand piano!

I think in general I could say that a fair proportion of the larger schools are equipped on the scale which I have described. With regard to the training of teachers in the use of film, I have only the word of those people I spoke to on which to form an opinion. But I do know that film is constantly referred to in the curricula of the Pedagogical Institutes, and also of the Scientific and Technological Institutes. There are also occasions when films are shown at institutions called Teachers' Clubs. In addition to these Clubs, there are, moreover, 75 Teachers' Refresher Course Centres. It is an obligation of a Soviet teacher to attend a refresher course after 3, 8, 13, 18 and 23 years of service—this applies to heads and assistants alike and also to inspectors! Attendance at these courses is for one year one day a week, and during these courses some attention is paid to the use of film, and there are film laboratories and many film projectors about the place.

What can you tell us about the equipment used, and about other audio-visual aids than ciné film?

The projectors in use in schools are all produced in the Soviet Union. They seem to be of a standard type and are comparatively simple to operate for anyone who has handled a projector anywhere else. The lamps used are normally of two degrees of brightness. One is probably about 500w and the other between 700w and 1000w. It is just a little difficult getting these things straight, because the Russians have a technical problem of their own in that the Moscow region is on 110 volts and the rest of the country is on 235 volts.

All classrooms are certainly not blacked out. As visual aids are only used with certain subjects, though, the rooms in which these subjects are taught are capable of being blacked out in a second. I saw no evidence of rear projection at all. It was throughout straightforward projection from a position at the rear of the class on to a screen which came down from above the blackboard, used in a blacked out room. I would hesitate to estimate what proportion of the teaching staff would be capable of operating a projector, but certainly the specialist teachers in the subjects which I have mentioned would be able to use them, even if they had no projector available. At no time did I see children projecting films.

With regard to other aids, I did discover that the loop film was in use for teaching certain repetitive things, particularly in the Trade schools. As I have said, I found filmstrips in abundance, and also slides. The slides are standard size—as you probably know there is an international agreement about this, which the Russians are keeping—and the slide attachments were fitted to their filmstrip projectors. Quite often I found them using the automatic, indexed type of slide carrier. It is very difficult to say about other types of visual aid. Undoubtedly a use is made of things like the magnetic board, flannelgraph and models but this is less common in schools than in the Pioneer Palaces, Pioneer Centres (of which I shall say more later), and the Pedagogical Institutes. We saw all sorts of wallcharts describing the educational pattern in the Soviet Union, in Pedagogical and Research Institutes. But throughout, there is an uncomfortable unawareness of the appeal of the visual. In fact out of some 40 classrooms which we visited, apart from those in which film was used for specific purposes, in only one did we find the walls being used for any intelligent purpose. I never saw a teacher make constructive use of the blackboard. It was used as an exercise book, on which the children wrote to show how well they had done their homework, or remembered a previous lesson, but the only time the blackboard tended to be used by the teacher was when he wrote the page and number of the exercise for the next lot of homework.

There is no school broadcasting in the Soviet Union at all. I was appalled to find this. They said that there was the problem of times, and fitting into the course, and quite bluntly that they found no reason whatever to introduce broadcasts for classroom use. This also means, of course, that there is no television for schools either. There are certain television programmes for youth, just as there is something approximating to "Children's Hour" on the radio, but these are not related to the work of the schools in any way. I do think, however, that there are possibilities of development here, and we may do something to convert Soviet teachers to different attitudes about this. At the moment their major preoccupation is with the two-shift system in schools and this so complicates the school time-table that broadcasting to schools is virtually impossible.

The tape recorder, on the other hand, is in use in almost every school. It is used by some teachers to provide a corporate life for the school. On some occasion when the school (or generally part

of the school) is gathered together it is used for the performance of children on instruments, the singing of songs from other countries, the recording of conversations with important visitors (as we did when visiting some schools) and so on. In some cases the equipment is made by former pupils who have gone to trade schools and come back and put the components together. So there are many and highly developed modes of tape recording in use in Russian schools. The recorders are used more in the teaching of music than for modern languages, though they are used for speech training in the latter case. I do not think they experiment much in the technique of presenting material on a tape; they would rather just get a voice on it and play it back to the class who are learning the particular subject.

Can you give us any information about the use of visual aids in further education or out-of-school activities?

There is an important body called the Committee for Political and Cultural Education, which is actually non-political, whose function is somewhat similar to that of the W.E.A. It runs millions of lectures during the course of the year and is supported by high level scholars in all the universities. This body does make use of film in adult education, but I suspect, however, that this is where political propaganda would begin to seep into the films used. Film is not used to tackle illiteracy, because this problem hardly exists now. You find the odd person over the age of 50 in Azerbaijan who is not literate, but anyone who is engaged in any kind of job of any importance is certainly literate. Indeed, it is a feature of the behaviour of people on public transport that of those who are reading, out of any 10, three or four are reading textbooks of one sort or another, no matter what their age—it is still possible for them to see a future ahead of them in education.

I think that the nearest thing which could be found to the film appreciation movement in this country, would be some organisation inside the Teachers' Clubs. But I do not think that outside the body of people who are making films or are being trained to make films, there is any particular awareness of film as an art form.

One of the most interesting developments which I found in the use of visual aids was in the Pioneer Palaces. These are organisations inside the cities to which a small proportion of the child population come to study in special circles. The Pioneer (Young Com-

munist) Movement begins in schools with a circle attached to a particular school which children will attend for two hours a week. Next there is the Regional organisation in which a number of schools will combine and meet in a Pioneer House, probably somewhere in the suburbs, and study such subjects as aero-modeling or modern languages which are not taught at school. Then finally in the big cities there would be the Pioneer Palaces. Indeed in Moscow and Leningrad these were properly named for they were former palaces. These are certainly beautiful buildings and in them there is a great deal of activity. In the case of Leningrad and also of Baku there were quite elaborate Planetaria, which had been designed by a Pioneer leader, who was also an astronomer and built with the aid of the children, who through their interest in astronomy had made all the visual aids in these planetaria. In one there was also an orrery, that is, a model to demonstrate the relative size and revolutions of the planets. In another there was a very skilful use of visual aids to stimulate a rocket flight leaving the earth. There was a running commentary, which the teacher gave, and there were as many as three projectors running simultaneously. One projecting straight in front gave a view of the earth as one receded from it, which had obviously been made from an actual film. Another projected on to the ceiling and gave you a view of the way you were going, and yet another came on from time to time on a side screen and gave statistics and information about distances covered and speeds. Round the wall, at the top, there was a silhouette of the prominent buildings in Leningrad, to give an impression of what the city would look like as you returned to it. It really did provide a most fascinating experience—I thoroughly enjoyed it! This is indeed quite a remarkable development which one could not have in a school, although it could be managed in a museum.

However, the number of Pioneer Palaces in which this sort of thing takes place is limited. But it is quite clear that as far as the normal school is concerned the film is completely accepted as a part of normal teaching method—with all the provision of equipment and films, including production of new films, which this implies.

BOOK REVIEWS

RUESCH, JURGEN and KEES, WELDON. *Nonverbal Communication.* Berkeley and Los Angeles, California: University of California Press, 1956. 205 p.

Reviewed by
• **FRANKLIN FEARING**

Nonverbal Communication is an uniquely imaginative approach to some of the ways in which man is made aware of the external world. Some of these modes of becoming aware depend on actions of other individuals and some do not, but none of them involve the more familiar verbal techniques through which human beings give and receive information. This reviewer has certain reservations regarding the term "communication" as used in the title and conceptualized throughout the book. It is his intent to state these reservations in the following paragraphs.

One of the functions of a good scientific hypothesis is that in some meaningful way it defines and delimits an area for observation. It does this through hypothetical constructs to which certain phenomena are ordered and among which certain relationships are postulated. This is good economy and good science. All of this, of course, is subject to verification through controlled observation. According to some psychologists, for example, the construct "perception" refers to a *certain kind* of transaction between the organism and the environment. Such a construct with its supporting hypothesis enables us, at least provisionally, to understand complex relationships among certain phenomena by genotypically unifying them. There may not be agreement as to what the phenomena are which bear the label "perception" but, however defined, perception is distinguished from other kinds of activities.

This is illustrated by Gibson in the introductory remarks in his book [3] on visual perception. When we talk about perception

Franklin Fearing is Professor of Psychology at the University of California at Los Angeles.

we are concerned, he says, with our experience of the external world. Or, stated in the form of a question, "Why do things look as they do?"

All of this applies with particular cogency to the currently popular term "communication." If this construct is to be an effective tool for scientific exploration it must, among other things, be used so as to meaningfully characterize, that is, delimit, certain kinds of interactions among organisms (probably limited to humans) in a way to distinguish them from other kinds of interactions. In the popular usage this is rarely done. If it is not done the term becomes so general as to lose its significance for scientific purposes.

The foregoing states—somewhat dogmatically, perhaps—this reviewer's reservations regarding the quotation which introduces *Nonverbal Communication*, and which appears to establish the conceptual frame of reference for the authors' entire presentation. The quotation is from Warren W. Weaver and is as follows:

> The word *communication* will be used here in a very broad sense to include all of the procedures by which one mind may affect another. This, of course, involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact all human behavior.

If communication is thus defined one may raise the question whether the term has any value other than that of the loose popular usage. This is not the place to outline a more restrictive conception — the writer has attempted such a presentation elsewhere [2]—but it is in order to point out how a comparatively simple distinction such as that made by Morris [3] may clarify and illuminate the complex problems involved. He distinguishes between *communization* and *communication*, both of which involve a "commonage" of meaning. An example will make his distinction clear. An individual who is angry may be the occasion for another individual becoming angry. This commonage of meaning is established through signs and is termed communization. But for communication to occur a person must use (produce) signs to *signify* anger which might or might not be accompanied by anger in the producer, or the occasion for anger in another. Thus *communication is incitive* (Morris' term), and its purpose is to affect the behavior of others in some manner. Signs produced by a human

agent play an unique role in the communicative process, and, in fact, their use distinguishes it from all other forms of human interaction.

The importance of these sign-symbol processes and the conditions of their use seems to be ignored in many of the currently popular discussions. In particular, the confusion or identification of perception with communication—a confusion which is implicit throughout *Nonverbal Communication*—makes it difficult to understand the unique character of the communicative process and its extraordinary contribution to human society. In perception, the contact with the external world is direct, idiosyncratic, and relatively global. As Maslow [5] has pointed out, language, and, it might be added, all sign-symbol processes, acts as a kind of screen between the individual and external reality. These processes are used to *mediate* perceptual relationships. This is the essence of the symbolic function and it is doubtful if it can occur except in the communicative situation.

The individual, of course, reacts to signs in many situations as pointing to something not at the moment affecting the sense organs of the perceiver. The contorted face of the infant in a temper tantrum is clearly a sign which indicates a certain bodily state, and is so perceived by others. These signs are expressive, and we may assume in most instances that they are not produced with intent to have effects, although they elicit appropriate behavior from adults. It would seem that only by a rather extreme metaphorical extension can signs in such a case be called "statements," or that they constitute "information." Many of the pictures reproduced in *Nonverbal Communication* are labelled "statements." A picture of a filthy garbage pail is called a "statement through a single object." A statement of what? It is important to note, however, if this picture is used to show inefficient methods of municipal garbage collection, it *is* a statement. If, in the case of the temper tantrum, the infant has learned that when he produces a certain kind of behavior he will receive attention, the signs, in Morris' terminology, are now used to signify and are used incitively. This distinction is not always easy to make, but this reviewer cannot agree with Ruesch and Kees when they say ". . . distinction cannot be made between the adaptive actions that implement homeostatic needs and communicative actions that increase a person's knowledge or convey information to others or achieve a calculated effect."

The theoretical bases for this distinction have been made by Arnheim [1] in the field of art and art production; by Werner [9] in his studies of developmental psychology; by Gibson [4] in his theory of pictorial perception; by Morris as noted; by Maslow; and, of course, by George Mead.[7] Maslow in particular has made a useful contribution in his discussion [6] of *expressive* and *coping* or *instrumental* behavior.

A problem which arises at this point is concerned with the degree of correspondence between signs or "surrogates," to use Gibson's term, and "reality." The discussion of this in *Nonverbal Communication* is, for this reviewer, less than satisfactory, and the difficulty seems to lie in the vaguely defined conceptualizations of the communicative process. The authors neglect the important fact that one of the essential characteristics of the symbolic processes is their mediating function, the result of which—as Maslow pointed out—is that they do not depict reality directly. This is true of photographs, motion pictures, and every sort of iconic (Morris' term) symbol as well as non-iconic symbols, e.g. language. When we understand that symbols serve a mediating function, that they are produced by a human agent and therefore depend on *his* apprehension of "reality," and that their essential function is to make it possible for two or more persons to share a common experience which is, itself, not a direct apprehension of reality, it is no longer necessary to approach the question of their "realism" as if it were a moral issue. The authors of *Nonverbal Communication*, for example, are critical of the documentary film because, in spite of its claim to be more realistic than the fictional film, "it is rich in falsification." In it human beings are not shown "as they actually are" but as the director or camera man "thinks they are or wants them to appear." One might reply, "Of course! That's why they were made." In certain situations there may be the problem of fidelity to an hypothetical reality—and there are ways of dealing with it—but even the most candid of candid camera shots are produced by a human agent and inescapably bear the stamp of his particular perception of the external world, and of his conscious or unconscious purpose in making it. At the risk of becoming agonizingly metaphysical, the question might be raised regarding the possibility of *ever* showing human beings "as they actually are."

In spite of the theoretical reservations expressed in the foregoing paragraphs, in this reviewer's opinion *Nonverbal Communication* is both an extraordinarily interesting book, and a very

significant contribution to a neglected aspect of human social intercourse. The hundreds of candid camera shots illustrating an enormous range of human social interactions which are not verbalized constitute, in themselves, an unique contribution to social psychology. Many of them are communicative within the definition of this reviewer, but all of them document the enormous extent to which our cognitions of external reality are independent of verbal techniques. For this reviewer a more meaningful title would have been "Our Nonverbal World."

REFERENCES

1. ARNHEIM, R. *Art and Visual Perception.* Berkeley and Los Angeles: University of California Press, 1954.
2. FEARING, FRANKLIN. "Towards a Psychological Theory of Human Communication." *Journal of Personality* 22:71-88; 1953.
3. GIBSON, JAMES J. *The Perception of the Visual World.* New York: Houghton Mifflin, 1950.
4. GIBSON, JAMES J. "A Theory of Pictorial Perception." *Audio-Visual Communication Review* 1:3-23; 1954.
5. MASLOW, A. H. "Cognition of the Particular and the Genetic." *Psychological Review* 55:22-49; 1948.
6. MASLOW, A. H. "The Expressive Component in Behavior." *Psychological Review* 56:261-272; 1949.
7. MEAD, GEORGE. *Mind, Self and Society.* Chicago: University of Chicago Press, 1934.
8. MORRIS, CHARLES. *Signs, Language and Behavior.* New York: Prentice-Hall, 1946.
9. WERNER, H. *Comparative Psychology of Mental Development.* Chicago: Follett, 1948.

BROWN, JAMES W. and LEWIS, RICHARD B., editors. *AV Instructional Materials Manual.* San Jose, California: Spartan Book Store, San Jose State College, 1957. 191 p.

Reviewed by
• **HERBERT HITE**

Ten different members of the staff of San Jose State College cooperated to produce this manual. It is, for the most part, an outline of laboratory experiences in using and preparing some three

Herbert Hite is Associate Professor of Education, Washington State College, Pullman, Washington.

dozen different kinds of instructional materials. Most of the subjects covered are of an "AV" nature, despite the broader implications of the title.

The book is divided into three main sections—creating materials, selecting and appraising materials, and equipment operation. Each section comprises a number of brief chapters, two to five pages in length, each one devoted to a specific type of learning aid.

In spite of the fact that there are 10 different authors, the editors maintain a consistency in style by holding to a standard format throughout each section. For example, in the section on creating materials, each chapter has an introduction, a statement of purposes, a list of equipment and materials required for the learning exercise which follows, and instructions for completing the assignment.

The scope of this manual is something new in the audio-visual field. The authors not only deal with audio-visual aids but also describe such printed materials as textbooks, periodicals, and encyclopedias; and such other materials as the spirit duplicator, aquariums, and terrariums. The result is praiseworthy as an effort to encompass the whole field of instructional materials. However, by placing relatively the same emphasis on so many widely different activities (from how to appraise a textbook, to how to make a stencil), the book naturally provides an uneven quality of coverage.

The section on producing instructional materials helps to meet a long-time need for an organized body of information in this area. There are 25 chapters in this section containing much useful "how-to-do-it" information. The authors do not explain why certain production techniques are left out and others included.

A minor flaw which detracts from the effectiveness of the manual is that the pictures are not always relevant to the text. Also, the type is sometimes too small for easy reading.

The *AV Instructional Materials Manual* should become a valuable contribution to the field as (a) an outline of laboratory experiences in connection with an introductory course in audio-visual methods, or (b) a manual of supplementary readings and assignments to accompany some other teaching methods course, or (c) a reference to any teacher desirous of applying materials to his own classroom situation.

RESEARCH ABSTRACTS

TELEVISION

KUMATA, HIDEYA. ***An Inventory of Instructional Television Research.*** Research by Institute for Communications Research, University of Illinois, Urbana, Ill. Published by Educational Television and Radio Center, Ann Arbor, Michigan. December 1, 1956. 155 p.

Purpose: To summarize findings on instructional television.

Procedure: One-page abstracts of 74 research studies were prepared. An additional 173 references were given for other television reports. These were incorporated in book form with a digest of the results. An appendix contains a survey of television courses.

Results: Television students usually do as well as other students and at times better. Research findings were collected on retention from television, methods of teaching by television, effect on learning of audience conditions, differential learning by various groups, feedback, types of subjects best taught, choosing television instructors, attitudes toward television, audience size and composition, amount of viewing, size of receivers, use of color and visual aids.—*L. Twyford*

HARSHBARGER, H. CLAY and BECKER, SAM L. ***Teaching by Discussion on Television.*** University of Iowa, Ames, Iowa. 7 p.

Problem: This paper is concerned with the feasibility of using television to enlarge a discussion group without making it cumbersome.

Procedure: A class in Comparative Foreign Governments, conducted predominately by the discussion method, was taught on a closed-circuit television system. Eighty-two students were divided into a studio group and two viewing groups. Fourteen students in the studio were seated in a V-shaped arrangement with the instructor at the apex in front of a blackboard. Name cards were used to identify the participants. Two cameras and four microphones were used to pick up whoever was speaking and to show reactions of the others. Students pressed buttons to indicate when they wished to speak. A second instructor prepared suggestions for the discussion leader and appraised the class performance with the discussion leader following each class meeting. No fancy television techniques were used and emphasis was on close-ups of people speaking and reacting.

Results: Political scientists and television people felt that the procedure was definitely feasible. There was some difficulty of sound pickup from the viewing rooms. About one-third of the students participated in the discussions. This amounted to 44 contributions per session. Students felt the method was as good as the standard method and perhaps a little better. They felt they did more work for the television class.—*L. Twyford*

PASEWARK, WILLIAM R. *Teaching Typewriting Through Television.* Research Report Number 17. Bureau of Business Research, College of Business and Public Service, Michigan State University. October 1956. 65 p.

Purpose: The purpose of this study was to determine the effectiveness of television as a medium for teaching beginning typewriting.

Procedure: Students taught by television were compared with students taught by conventional methods. One instructor taught both experimental and control groups for 48 lessons of 50 minutes each. The groups were compared on a timed writing test and a production test at the end of the course. Also, achievement on nine timed writing tests administered during the course was analyzed.

Results: Television trained students typed significantly faster than conventional students on a timed writing test. They also made fewer errors. It was concluded that television is an effective medium of learning beginning typewriting.—*L. Twyford*

ULRICH, JOHN HOLWAY. "An Experimental Study of the Acquisition of Information from Three Types of Recorded Television Presentations." *Speech Monographs* 24: No. 1, March 1957. 7 p.

Purpose: This study was designed to determine whether eighth-grade pupils retained more information from observing a kinescope recording of a lecture (a) without visual aids, (b) one with aids handled by the lecturer, or (c) the same lecture with aids that were merely flashed on the screen.

Procedure: A 76-item objective test was prepared on the food resources of Africa which was selected as the lecture topic. Nineteen items were retained after pretesting with experts and a sample of students. One lecture was prepared which was used for each kinescope with the different visual treatments. Fifteen hundred eighteen pupils were shown a kinescope recording and tested immediately following. The students were retested a month later.

Results: A kinescope with poster type visual aids produced more learning than one without such visual aids. Whether the visual aids were handled by the lecturer or not seemed to have little effect on the recall of information. After 30 days differences between lectures employing visual aids and those not

employing them tended to disappear. Although the author did not deny the value of visual aids the findings suggest that further research in this area would be rewarding.—*L. Twyford*

LUND, KENNETH W.; ENGLEHART, MAX D.; and NEE, MARY M. "Teaching Algebra and Physics by Means of Television." *Chicago Schools Journal.* September-October, 1956. 9 p.

Purpose: To discover whether television could be used to advantage to teach high school algebra and physics.

Procedure: Ten lessons on each subject were telecast over Station WTTW, Channel 11, to pupils in 34 Chicago high schools. Lesson guides were prepared for the lessons on quadratics and the lessons on machines. Achievement tests were administered to television and regular instruction groups immediately after the series. Scores were corrected for differences between the groups selected. Students and teachers completed rating scales to indicate their opinions.

Results: Television instruction was slightly more effective than regular instruction but the difference was not significant. More able students learned somewhat more from television but these differences were not significant. Students felt that repetition of key points was useful; postlesson discussion was important; inability to ask questions was a limitation; and that too much material was presented. Instructors felt that instruction over television was excellent, clear, and well organized, was visually effective and effectively summarized. They felt that too much material was covered and that television instruction was less effective than regular instruction. Reaction seemed to indicate a concern that television was being tested to replace the teacher.—*L. Twyford*

MEIERHENRY, W. C. *A Study of Teaching by Television Under Two Conditions.* The University of Nebraska, Lincoln 8, Nebraska. 1955. 14 p.

Purpose: To discover whether instructional television received in the home is as effective as television instruction in the classroom. This problem is important in view of the lack of physical facilities for instruction.

Procedure: Twelve students took a course on audio-visual materials for teachers in their homes. An equal number viewed the same television programs in the campus classroom. Twenty-eight television lecture-demonstrations 30 minutes in length were presented during a summer session. Both groups were expected to read assignments in the textbook. Each group took the same test upon completion of the course. The on-campus group remained for 20 minutes in the classroom and had an entire class period of practice on equipment which the home groups missed. The home group turned in written

assignments. The campus group had more formal preparation while the home group had more teaching experience.

Results: On the basis of the small group of participants it was found that there was no significant difference in the final test scores. Answers to a questionnaire indicated that the home group was more enthusiastic about the television instruction and did not miss the instructor-student relationship. Both groups indicated satisfactory acceptance of the course. The television instructor felt that preparation time was too great and represented an unrealistic work load.—*L. Twyford*

CINCINNATI PUBLIC SCHOOLS. *A Study of the Effectiveness of Television as a Medium of Instruction in High School Chemistry 1955-1956.* Cincinnati Public Schools, Cincinnati, Ohio. June 1956. 7 p.

Purpose: To measure how effectively chemistry can be taught by television in Cincinnati and to give more pupils the opportunity to benefit from outside expert help.

Procedure: The instruction was presented over an educational television station for seven weeks. Six high schools with 186 students participated while 702 students received instruction in the usual way. Questions from the students were forwarded to the studio for the television instructor to answer. Lectures were televised three hours a week and all groups had regular laboratory periods twice a week. Three locally constructed objective tests and one standardized test were administered.

Results: Average achievement in chemistry for the entire year's work as measured by Anderson's Chemistry Test was approximately the same for both groups. On the test covering the seven weeks' instruction the television group received significantly better scores.—*L. Twyford*

MARTIN, JOHN R. *Two-Way Educational Closed Circuit Television.* Research Report Number 1948-1, Department of Electrical Engineering, Case Institute of Technology, Cleveland, Ohio. January 15, 1957. 10 p.

Purpose: To investigate the technical feasibility of two-way television communication between an instructor and several classrooms.

Procedure: A radio frequency distribution system was used in conventional manner to send a picture and sound of the instructor to several classrooms. Each classroom had a television camera located above the receiver which transmitted a picture of the class over a different television channel using the same coaxial cable back to the instructor.

Results: It was found desirable to have a monitor receiver from each classroom for the instructor to watch. The classroom cameras should be placed above the receivers to maintain the illusion of personal contact. These cameras can be controlled remotely to locate any student; however this was found to be distracting and it was recommended that a single fixed position lens be used. Any room appeared to be a satisfactory origination point. Overhead fluorescent lighting with a uniform intensity of 60 to 80 foot-candles on a surface 30 inches from the floor was found to be sufficient using an f/1.5 lens. Objective studies of the methods employed were being conducted.—*L. Twyford*

SEIBERT, W. F. ***A Brief Report and Evaluation of Closed-Circuit Television Instruction in Mechanical Engineering 360.*** Audio Visual Center, Purdue University, Lafayette, Indiana. 15 p.

Purpose: To discover whether achievement in Mechanical Engineering is better or worse when television is used.

Procedure: One group received conventional instruction all semester, attending class and laboratory sessions under conventional conditions. A second group, composed of 46 students in two classrooms, received the nonlaboratory portion of the instruction via television. Twenty-four inch television receivers were used. A telephone was installed for the students to ask questions. Achievement was measured by a 28-item test. A questionnaire containing 10 questions was administered.

Results: The research suggested several conclusions. Student achievement was substantially the same for both groups. Student attitudes were somewhat negative. Favorable responses included comments on the instructional value of TV demonstrations, student comfort during televised classes, classroom discipline, and a general acceptance of television for instruction. Unfavorable comments concerned the inability to discuss questions with the instructor, lack of opportunity to take notes in class, and lack of opportunity to become acquainted with the instructor.—*L. Twyford*

PURDUE UNIVERSITY. ***Closed Circuit Television Instruction.*** Purdue University Station WBAA, Lafayette, Indiana. 1956. 6 p.

Purpose: To discover student and instructor reactions to closed circuit television instruction in three courses and to measure the effectiveness of the methods.

Procedure: Analytic geometry, government, and general bacteriology were the three subjects televised. Only a few lectures from each course were televised. The instructor made his presentation alone in the studio with the exception of a group of 15 students in the government course. Classes ranged in size from 26 to 51. A phone handset was used for talk-back. No major changes were made in the instructional presentation.

Results: In the course on analytic geometry the student reaction was not enthusiastic and the two-way communication was not satisfactory. The test scores for the group were not significantly different from previous years' scores. The instructor objected to the heat in the studio and objected to loss of student reaction. In the government course more visuals were used. Students complained of lack of talk-back to instructor, lack of clarity of visual material, difficulty of note taking due to darkness, lack of instructor in the room, inability to see over classmates, and restriction of movement of the instructor. Students liked the improvement in the instructor's preparation, inclusion of more visuals, and the advantage television has for directing attention of the viewer. No discernible difference in student achievement was measured by the tests. The instructor was bothered by the heat of the lights and he missed the presence of students and felt he was somewhat "stiff" in his lectures. In the general bacteriology course the students felt that they learned a little more; the course was more interesting; television permitted closer viewing, more variety of demonstrations, and made it possible to pay attention and learn easier. They objected to the viewing comfort of a lab stool, glare from glassware, impersonal presentation, too small a screen, and other technical difficulties. Little difference was noted in test scores. The instructor felt he could do a better job with the close-up techniques although he felt he would have to develop new techniques.—*L. Twyford*

TRAINING AIDS

CANTOR, JOAN H. and **BROWN, JUDSON S.** *An Evaluation of the Trainer-Tester and Punchboard Tutor as Electronic Trouble-Shooting Training Aids.* Technical Report NAVTRADEVCEN 1257-2-1. Research by George Peabody College for Teachers, Nashville, Tennessee, for the U. S. Naval Training Devices Center, Port Washington, N. Y. October 3, 1956. 61 p.

Purpose: The purpose of this research was to evaluate the effectiveness of two paper and pencil training aids for teaching elementary electronics trouble shooting. The two methods were to be compared with the standard Navy method of training with actual operational equipment.

Procedure: One of the training aids was the Trainer-Tester which presents the student with a written list of symptoms exhibited by a malfunctioning piece of equipment and requires him to go through a number of hypothetical tests and measurements until he can determine which component is defective. Using only the Trainer-Tester sheets and a pencil, the student can think through a problem, try out alternative hypotheses, obtain information concerning the consequences of provisional attempts to correct the malfunction, and eventually discover the correct solution. The Punchboard Tutor is a device for self-administration of multiple choice test items. Questions are presented separately on mimeographed sheets. Identical problems were prepared for presentation on the two devices and by regular instructional

methods. Performance was compared in terms of course examinations, laboratory grades, and scores on special trouble-shooting examinations. Follow-up data was obtained for trainees who later took advanced courses.

Results: Students who used the two training aids were superior to those who used equipment only. Training aid students remained superior later in their advanced course. The results indicated that the training aids can be used successfully as partial replacements for actual equipment in elementary trouble-shooting training.—*L. Twyford*

WOOLMAN, MYRON. ***A Method of Training Aids Selection.*** Final Project Report 54-8. Training Analysis and Development Division, McConnell Air Force Base, Wichita, Kansas. December 1954. 44 p.

Purpose: The purpose was to develop a student-oriented method of training aid selection and to provide a guide to efficient training aid selection.

Procedure: The task was broken down into three steps: (a) identification of the students' learning task, (b) evaluation of the learning task, and (c) relating the learning task to an appropriate training aid.

Results: The identification of the students' learning task must be distinguished from the task the instructor faces. The first criterion for identifying the students' learning task is to relate the area of instruction to the on-the-job performance required of the student. This may be done by making a list of items in the course outline and a list of skills and knowledges expected of the student on the job. These lists should be analyzed until the basic knowledges and skills can be easily stated. Information may be classified as (a) names, (b) locations, (c) functions, (d) relations, (e) principles, and (f) theory. The numbers are of increasing levels of difficulty and are placed next to each skill or fact to be learned. The kind of training aid is related to this level of difficulty. Names can be taught with simple training aids while theory may require complex aids. Skills are likewise classified according to difficulty. Training aids are classified according to dimension, mobility, and operation. Six information levels and four skill levels are related to training aids by examples and rules for each. These dimensional items may be plotted as a profile. An existing training aid is evaluated using a form having nine scales on which one rates operational utility, learning level, function, naming and location, flexibility, relation to post-training, training standard items, complexity, and estimated cost. The score for the device is the sum of these ratings.—*L. Twyford*

SCOPINO, JOHN A.; GARTNER, WALTER B.; MANNING, FRANK E.; and OLDER, HARRY J. ***Study of the Present Status of Training Aids and Devices in the Army Transportation Company Officers Course.*** Technical Report NAVTRADEVCEN 1927-00-1. Research by Psychological Research Associates for the U. S. Naval

Training Devices Center, Port Washington, L. I., N. Y. June 30, 1956. 65 p.

Purpose: To investigate the current status of training aids being used in an Army transportation school. This included a study of the optimum utilization of current training aids, devices, and a recommendation of new or improved training aids wherever it was deemed necessary.

Procedure: Training aids such as two-dimensional graphics, films, and models were the primary aids studied. Data was obtained from vault files, interviews with instructors, evaluation forms, student surveys, and instructors' opinions.

Results: One hundred fifty training aids were surveyed. Of these 78 were satisfactory in their present form, 54 were satisfactory if modified, and 18 were judged unsatisfactory. The most common weakness of the training aids was their lack of attention value. It was recommended that certain aids be modified and that others be substituted for unsatisfactory aids. An important recommendation was that optimum utilization be made of existing aids. Fourteen recommendations were given to increase attention value; 10 to increase legibility; 5 to increase comprehensibility; and 9 to improve relevance. Thirty-five points were stressed to insure optimum utilization of the training aid.—*L. Twyford*

MODELS

OFFICE OF EDUCATION. *Three-Dimensional Teaching Aids for Trade and Industrial Instruction.* Circular No. 366. Division of Vocational Education, Office of Education, U. S. Department of Health, Education, and Welfare. 1953. (Copies may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 50¢.)

Purpose: This survey and compilation of three-dimensional teaching aids for trade and industrial instruction was made to illustrate the ways in which instructional aids may be used, to promote their use in trade and industrial teaching, and to stimulate the interest of teachers to create comparable aids.

Procedure: A committee on teaching aids appointed at the North Atlantic Regional Conference for Trade and Industrial Education obtained material on 89 training aids produced by schools throughout the country. A photograph was obtained of each device and a paragraph was written about each. The photographs and paragraphs were incorporated in this publication.

Results: The publication includes the following numbers of training aids: aircraft, 3; auto mechanics, 15; bricklaying, 1; carpentry, 10; electrical, 16; machine shop, 13; mechanical drafting, 7; needle trades, 2; plumbing, 4; printing, 1; photography, 1; radio, 1; sheet metal, 3; upholstery, 1; related subjects, 11.—*L. Twyford*

SPECIAL ISSUE OF AUDIO-VISUAL COMMUNICATION REVIEW

GRAPHIC COMMUNICATION AND THE CRISIS IN EDUCATION. Paper bound $1.25; cloth bound $2.00. Discounts on quantity orders apply.

OTHER PUBLICATIONS

of the

Department of Audio-Visual Instruction
National Education Association of the United States
1201 Sixteenth Street, Northwest, Washington 6, D. C.

A Directory of Graduate AV Programs for the Professional Education of Audio-Visual Supervisors, Directors, and Building Coordinators, $0.50

National Tape Recording Catalog, Second Edition, $1.00; 1958 Supplement, $0.50

The School Administrator and His Audio-Visual Program—1954 Yearbook, $3.75

Television in Instruction: An Appraisal, $1.00

Planning Schools for Use of Audio-Visual Materials—No. 1, Classrooms, Third Edition, $1.50

Planning Schools for Use of Audio-Visual Materials—No. 2, Auditoriums, $1.00

Planning Schools for Use of Audio-Visual Materials—No. 3, The AV Instructional Materials Center, $1.00

Planning Schools for Use of Audio-Visual Materials—No. 4, Audio-Visual Centers in Colleges and Universities, $1.50

Proceedings of DAVI Television Seminar, $1.00

Membership in
Department of Audio-Visual Instruction
Including subscription to AUDIO-VISUAL INSTRUCTION
$5.00

All publications, except Audio-Visual COMMUNICATION REVIEW, are subject to the following discounts on quantity order:

2 to 9 copies	10%
10 or more copies	20%
For resale purposes	20%

Orders for $1.00 or less must be accompanied by a check or money order.